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ABSTRACT

Data from 10,000 17-year-old respondents to the National Assessment of Educational Progress (NAEP) 1975-76 Special Mathematics Probe (Basic Mathematics Assessment) were analyzed. The primary purpose was to identify respondents' background characteristics associated with basic mathematics achievement. The achievement items and 241 background variables were reduced through clustering techniques to composites: academic orientation; comfort/confidence about mathematics; community characteristics; effort in mathematics; extracurricular activities; individual program characteristics; locus of control; mathematics courses taken; personal demographics; school program variables; self esteem; and television watched. Causal models relating achievement to background found some relationship between the availability of specialized equipment, specifically computers, and student interest as evidenced by the number and level of mathematics courses taken by students with similar academic orientation and background. After these variables were controlled, internal locus of control and greater levels of mathematics confidence were significant predictors of achievement. Although related to attitudinal measures, predictors were generally the same for both sexes. Predictor patterns were generally similar with respect to race but large differences in achievement levels were not explained by the variables. Descriptive analyses and summaries of achievement data from 13-year-old respondents are included. Primary type of information provided by the report: Results (Secondary Analysis). (Author/CM)

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AMERICAN INSTITUTES FOR RESEARCH
IN THE BEHAVIORAL SCIENCES
P.O. Box 1113, 1791 Arastradero Rd., Palo Alto, Ca. 94302 ● 415/493-3550

FINAL REPORT

SUPPLEMENTARY MATHEMATICS PROBE STUDY

Submitted to:

National Assessment of Educational Progress
300 Lincoln Tower
1860 Lincoln Street
Denver, Colorado 80203

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Submitted by:

Peter Enemark
Lauress L. Wise
American Institutes for Research

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ABSTRACT

This project was designed to analyze data from 10,000 17-year-old respondents to the National Assessment of Educational Progress (NAEP) 1975-76 Special Mathematics Probe (Basic Mathematics Assessment). Its primary purpose was to identify respondents' background characteristics associated with basic mathematics achievement. This report also provides descriptive analyses and summaries of achievement data from 13-year-old respondents.

The 40 (for booklet 1, 43 for booklet 2) achievement items and the 241 background variables for each of the 17-year-olds were reduced through logical and statistical clustering techniques to a more manageable and psychometrically sound set of 13 composite variables. Correlation, regression, and analysis of covariance structures were used to develop and verify causal models relating achievement to the background variables.

The results of this study identify some of the manipulable factors influencing high school mathematics performance and we hope will lead to recommendations for the improvement of instruction. Non-manipulable factors (e.g., personal demographics) that account for significant proportions of variance can be used to predict possible skill deficiencies and tailor resources to the needs of particular student populations. Finally, this report provides feedback to NAEP concerning the quality of its data tape and the utility of the 1975-76 data.

SUPPLEMENTARY MATHEMATICS PROBE STUDY

The National Assessment of Educational Progress has surveyed 9-year-olds, 13-year-olds, 17-year-olds, and adults on an annual basis since 1969 "to determine the nation's progress on education." Ten different learning content areas have been assessed to date--one of which is mathematics. Only two or three different subject areas are assessed in each assessment year. (Assessment years are numbered as follows: 1969-70--year 01; 1970-71--year 02; and so on.)

NAEP has assessed mathematics achievement three times between 1969 and 1981. The first mathematics assessment was in 1972-73 (year 04 of NAEP). The next assessment[1] was in 1975-76 (year 07) and was a supplementary probe of respondents' basic mathematics skills. The most recent assessment[2] was in 1977-78 (year 09). The Supplementary Mathematics Probe was specifically designed to assess selected basic competencies of two age groups: 13-year-olds; and in-school and out-of-school 17-year-olds. It used a smaller sample per grade (about 10,000 students) than has been usual for NAEP (about 30,000 per grade), and did not include 9-year-olds or adults. The data collected included that from the achievement exercises designed to cover basic computational operations, graphs, charts, symbols, and word problems as well as certain standard information collected by NAEP, such as sex, race, parents' education, size of community, and so on. In addition to these data, a wealth of other relevant data was collected from the 17-year-olds by a Supplementary Student Questionnaire. It is these 17-year-olds in the Supplementary Mathematics Probe that were chosen as the primary focus for the research reported here.

The remainder of Part I is organized as follows:

A. Research questions
B. Design and methodology
    1. Initial steps
        a. Editing the data
        b. Selected descriptive statistics

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[1] Because of its limited scope, the 1975-76 assessment is usually referred to as "the Supplementary Mathematics Probe."

[2] The 1977-78 assessment (which is, in some sense, the third assessment) is almost always referred to as "the second mathematics assessment."

2. Preliminary analyses
    a. Examining scales within the achievement items
    b. Developing scales from background variables
    c. Developing and testing preliminary models of mathematics achievement
3. Final analyses
    a. Revising and refining the achievement models
    b. Conducting confirmatory analyses

C. Results and implications

Research Questions

The mathematics skills that high school students and young adults have been able to demonstrate on surveys such as NAEP's 1972-73 and 1977-78 mathematics assessments have been well below most widely accepted performance criteria. For example, Reys (1976) discusses the ability of Americans to carry out consumer mathematics, and notes that only 16 percent of the young adults in NAEP's 1972-73 survey could correctly complete a checkbook-balancing exercise. It may be argued that this task is a relatively difficult one, but even the simplest NAEP exercises have disturbingly high error rates. For example, almost 10 percent of the adults surveyed in the first assessment were unable to identify the largest number in the following set: 5.0; 0.5; 0.05; and 0.005 (NAEP, 1975). Moreover, NAEP's document comparing the results of two assessments (Mathematics Technical Report: Summary Volume, 1980) reports a decline in performance across all ages and almost all exercises between the first (1972-73) and the second (1977-78) assessments. This is indeed a serious problem and mirrors the achievement decline reported for the College Boards and other nationally administered tests. We believe our secondary analysis of supplementary mathematics probe sheds some light on this critical situation.

The research reported here involved developing and testing models that relate the background variables derived from questionnaire data gathered on in-school and out-of-school 17-year-olds to these respondents' performance as measured by the achievement items on the 1975-76 supplementary mathematics

assessment. The major thrust of the study was to explain as much of the variance in the respondents' achievement as possible.

The primary goal of this research was to examine the effects of various demographic, attitudinal, and environmental variables on student performance in the 1975-76 mathematics probe. The factors we examined are listed below:

academic orientation;
academic orientation;
comfort/confidence about mathematics;
community characteristics;
effort in mathematics;
extracurricular activities;
locus of control;
math courses taken;
individual program variables (school characteristics);
personal demographics;
school program variables;
self esteem;
television watched.

The overarching objective of this study was to increase the knowledge of mathematics achievement by examining the relative contributions of the above variables to student performance on the math exercises. Specifically, the first objective was to examine nonmanipulable factors associated with achievement. Improvement of educational practice may be achieved by using these factors diagnostically to identify potential problem areas and to individualize instruction. The second objective was to examine manipulable factors associated with achievement, on the assumption that direct improvement of educational practice may be accomplished through the future manipulation of these factors.

The special mathematics probe of the National Assessment of Educational Progress conducted in 1975/76, provides important data not only on mathematics achievement levels but also on characteristics of students and of their schools that are likely to be related to mathematics achievement. The study presented here is designed to investigate such relationships. Two questions are of particular importance in this investigation:

- o can characteristics of school programs be identified that are associated with higher levels of mathematics achievement?

- can we identify intervening variables that suggest how students in disadvantaged groups might be helped?

With regard to the first question, the initial prospects are none too promising. In analyzing extensive data from Project TALENT, Jencks and Brown (1975) found little evidence for between school differences in achievement levels after controlling for differences in student background characteristics. While a subsequent reanalysis focusing more closely on the high school curriculum (Wise & Steel, 1979) did find more significant between school differences in mathematics achievement, there were few significant relationships to school program variables. The primary problem is that school program variables tend to be significantly correlated with the background characteristics of the student body so that it is virtually impossible to unambiguously attribute achievement levels to either the program or the background characteristics in a purely correlational study. Nonetheless, the 1976 mathematics probe did collect important information on differences in school programs which are closely related to mathematics instruction. A present analysis of these data is designed to suggest fruitful directions for more carefully controlled studies.

The second area of investigation is designed to contribute to our understanding of the mechanisms that lead to lower levels of achievement for particular groups of respondents. Gender differences in mathematics have been studied in some detail in recent years. (A summary of recent research in this area is being prepared by the National Institute of Education.) Many of the variables found to be related to gender differences in achievement are captured to some extent in the 1976 mathematics probe (e.g., locus of control, self confidence vis-a-vis mathematics, number and type of courses taken), while others are not (e.g., interest in math-related careers). Gender differences in mathematics have been of particular interest partly because of the lack of significant gender differences in other academic areas. Race differences, on the other hand, tend to cut across academic areas. Both race and gender differences along with differences in achievement associated with parents' socioeconomic level are investigated in the present study.

Design and Methodology

This study was designed to examine theoretically important characteristics of both respondents and characteristics of respondents' school environments that relate to achievement in mathematics. We chose to focus on the data for 17-year-olds from the NAEP Supplementary Mathematics Probe of 1975-76. These particular data were selected because of the extensive information collected by a Supplementary Student Questionnaire and because of the unusually large sample size. The supplementary questionnaire allowed this study to relate academic achievement to several theoretically relevant instructional and attitudinal variables as well as to examine standard demographic predictors of achievement such as age, sex, race, SES, and community size. The large sample size allowed us the flexibility to develop models on subsamples of the data and to conduct confirmatory analyses on the remainder of the data.

The 10,000+ respondents in the Special Probe of 17-year-olds were surveyed by NAEP in two groups of approximately 5,000 each. Each of these groups received a different set (booklet) of either 43 or 40 mathematics achievement items. All respondents completed the same supplementary questionnaires and other background information data collection forms. Because the usual number of respondents per booklet on NAEP assessments has been about 2,500, the two groups of 5,000 available for the proposed research can be considered "double samples."

The first step in our analysis plan was to examine and describe the data. The sophisticated statistical techniques used in the later stages of this study are particularly sensitive to errors and to extreme values in the data. Because these statistical procedures do not inform the user when critical assumptions have been violated, the careful researcher must be aware of these pitfalls beforehand.

A set of decision rules for data screening were developed and applied early in the study. These rules used a combination of internal and external checks as bases for verifying the reasonableness of the Special Probe data. Internal checks were used to screen out response anomalies; and external checks ensured that data from the year 07 probe conformed to trends established by the year 04 and year 09 assessments.

In addition to problems caused by inconsistencies and outliers, missing data can also have profound effects on the results of later analyses. To

examine the missing data we used the Statistical Analysis System (SAS) procedure PROC IMPUTE (Wise & McLaughlin, 1981), which performs two functions. First, PROC IMPUTE describes the pattern of missing data, which allowed us to answer such questions as where the missing values were located, how extensive they were, whether particular pairs of variables had values missing in the same cases, and whether cases with missing values were extreme vis-a-vis achievement. The second function of PROC IMPUTE was to compute covariance and correlation matrices, and from them, to provide estimates which were used to replace missing or out of range values in our perliminary and confirmatory analyses.

Initial Steps

The overall analysis plan was carried out in three phases, each with its own specific goals and its own particular products. Phase I focused on general data cleaning and on descriptions of the data files. During Phase I standard descriptive statistics (means, medians, standard deviations, proportions, frequencies, and so on), were calculated with several related goals in mind. An early goal was for project staff to familiarize themselves with the data and to become knowledgeable about the sample and its characteristics. This preliminary phase allowed the staff to carry out data cleaning routines and to investigate the psychometric properties of the variables to be carried throughout the entire study. Finally, descriptive results were compared with those from NAEP's two other mathematics assessments.

Editing the Data. The reader can imagine that the receipt of a data tape containing approximately 20,000 student records with as many as 280 variables per student might create immense data editing problems for researchers embarking on secondary analyses. Indeed, simply understanding the information represented by this amount of data poses a challenge to the researcher. We were pleased to find the tape we received from NAEP contained four data files that were remarkably free of errors. Moreover, all but one of the "bugs" on the tape were documented in the "Clarifications and Corrections" section of the User's Guide.

One of the initial steps taken by the AIR project staff to familiarize itself with the data was to dump the first 50 records from the four data files and 20 supplementary files (the User's Guide, Appendices, SPSS input

control card files (i.e., SPSS setups); codebooks, and so on) so that they could be inspected visually for format and quality. The SPSS setups were run through the SPSS EDIT facility and found to be substantially correct. There were two variables which had the same name (ENCYCLPD). This anomaly was caught by the SPSS EDIT program and the two variables were renamed ENCYCLSQ and ENCYCLTS to distinguish between data collected in the supplementary student questionnaire (SQ) and data collected on the tailsheet (TS--the last page of questions in a booklet).

After the appropriate corrections were made to the SPSS setups provided by NAEP to eliminate the errors noted in the User's Guide and the errors identified by the EDIT run, selected variables (some of the standard NAEP variables, such as Community Size; and a sample of released exercises--i.e., achievement items made public by NAEP) from the data files were run unweighted using the SPSS FREQUENCIES subprogram. The output from this run was compared to each category of the selected variables reported in the NAEP codebooks to confirm that our values matched NAEP's values.

Each respondent record is weighted with the inverse of the probability of that respondent being chosen. Records can be processed by statistical packages such as SPSS either weighted or unweighted. The next step in the external edit checks was to run the SPSS FREQUENCIES subprogram using students' weights (the variable WEIGHTF) to compare the results to those reported in NAEP's (1977) "Selected Supplemental Mathematics Exercises."

NAEP's codebooks report unweighted frequencies for all the responses for each multiple-choice exercise (achievement item). That is, the frequency of each correct answer is reported and the frequency of each of the incorrect answers (distractors) is also reported. In "Selected Supplemental Mathematics Exercises," however, only the weighted frequencies of the correct answers are reported. NAEP uses the term "p-values" to define the frequencies of correct answers (i.e., the percentages of correct responses to exercises). To compute p-values for each respondent record in the data files we created dichotomous variables with the values right ("1") and wrong ("0").

The 17-year-old respondents are divided by NAEP into three groups: in-school respondents; out-of-school respondents; and follow-up respondents. (The last named group is composed only of respondents who regularly attend school. There are no out-of-school follow-up respondents.) SCHOOLX is the

variable which distinguishes these three groups. In addition to there being three groups of respondents, there are also two weighting variables for 17-year-olds: WEIGHTS, for analyses of in-school respondents only and WEIGHTF, for any analyses which include the other two groups.

The p-values (percentages of correct responses to exercises) reported by NAEP in "Selected Supplemental Mathematics Exercises" were computed for in-school respondents and follow-up respondents using WEIGHTF. When we computed weighted frequencies using WEIGHTF for the same two groups of students using the SPSS subprogram FREQUENCIES, the results for all the achievement items (exercises) matched the p-values exactly as reported by NAEP. Weighted p-values for all the exercises in the two 13-year-old booklets were also computed (using WEIGHTS, the only weighting variable for 13-year-olds) and these also matched NAEP's p-values as reported in "Selected Supplemental Mathematics Exercises."

Three pairs of items were included in data collection instruments as internal edit checks for the 17-year-old samples. Both the supplementary student questionnaire and the tailsheet asked for information about the presence or absence in respondents" homes of (a) a regularly delivered newspaper, (b) magazines, and (c) an encyclopedia. Table 1 shows the within-respondent agreement on the following scale:

3 -- complete within-respondent agreement about newspaper, magazines, and encyclopedia

2 -- within-respondent agreement about two of these three points of information

1 -- within-respondent agreement about only one of the three points of information

0 -- complete within-respondent <u>disagreement</u> about all three points of information.

The data in the table are broken down by booklet and by three categories of respondents within each booklet: in-school, follow-up, and out-of-school. Overall, the agreement is quite acceptable with almost 90 percent of the subjects in both samples agreeing on all or on two out of three items.

Most of the achievement items, or exercise partss on the Special Probe assessment are coded in the following manner:

1. Foil 1
2. Foil 2

3. Foil 3
4. Foil 4
7. I don't know (often abbreviated "IDK")
8. No response
9. Missing value

One of the foils is the right answer and is identified as such. The other three foils are distractors, or wrong answers. All of the exercises on this tape are multiple choice. Respondents are encouraged to mark IDK by the following two sentences: "For most of the exercises, one of the response choices is 'I don't know.' If you feel you don't know the answer, fill in the oval beside 'I don't know.'" The last two values, "8. No response" and "9. Missing Value" are the least common. "Missing Value" indicates the respondent was not presented with the item, e.g., did not attempt the item due to being out of the room. "No Response" indicates that the item was presented to the student, but that he or she made no response, i.e., neither chose one of the four multiple choices nor marked "IDK." While one would expect a few students to have one or two "No Response" or "Missing Value" codes, the reason for any student having a large number of either of these "non-responses" is difficult to understand.

Table 2 shows the number of students in each of several categories of "No Response" and Missing Value" codes. We decided to eliminate students with four or more "Missing Values." This decision had the effect of removing about one percent of the respondents in each of the booklets administered to 17-year-olds, and we believe will improve the reliability of the results by eliminating respondents tested under unusual circumstances, (e.g., early termination of the administration of the exercises).

Selected Descriptive Statistics. In order to give the reader a picture of the demographic composition of each of the four samples, we selected 11 background variables from the 117 available for 13-year-old respondents, and 16 background variables from the 241 available for 17-year-old respondents. Eight standard NAEP variables and eight other variables identified in its publications by NAEP as being significant were selected. Information about these variables is shown in Table 3. The variables are listed in the order they appear in the data files.

Table 3 is intended to permit the reader to compare the background characteristics of the students in each data file. Percentages for the

categories within each variable do not always total 100 percent. In some cases, "other" categories have been omitted to save space, and thus the percentages add up to less than 100. In other cases, there is a possibility of multiple responses, and thus the percentages add up to more than 100.

The samples are composed of almost equal numbers of boys and girs, the majority of whom are White (83 percent), although Blacks, (11 percent) and Mexican Americans are also represented. The figures above compare closely to the U.S. Bureau of the Census figures for 14- to 17-year-olds in 1974 which are White: 85 percent and Black: 14 percent. Parents of approximately 40 percent of the sample had some college experience, and parents of another 30 percent were high school graduates. Almost 50 percent of the 17-year-olds report spending up to five hours per week on homework, and almost 40 percent of them intend to go on to a four-year college.

In its publication "Changes in Mathematical Achievement, 1973-1978," NAEP notes that there was a significant decline in average performance for both 13-year-olds and 17-year-olds between 1973 and 1978. For the former, the overall decline was two percentage points; for the latter, the decline was four points. There are variations in this average decline, of course. For example, 17-year-olds declined two points in mathematical knowledge (when items about the metric system, which are outliers, were excluded by NAEP) and five points in mathematical skills.

The data from the Special Probe fill in part of the picture in the middle (1975-76) of this period of decline (1973-78) for one type of exercise: items testing respondents' knowledge of the kinds of mathematics usually taught in grades one through six (i.e., basic mathematics). The average performance of 13-year-olds and 17-year-olds on 18 basic mathematics items common to the 1972-73, 1975-76, and 1977-78 assessments is shown below in Table 4. We excluded two items having to do with the metric system and a third item whose p-value is below chance level.

Development of Scales and Composites

The two major goals of Phase II were data reduction and the generation of analysis hypotheses and plans to be carried out in the preliminary analyses of this phase and in the confirmatory analyses of Phase III. Although at first glance there seem to be inordinately large numbers of both dependent and independent variables to be examined, most of the individual items

were linked either theoretically or empirically to one of a much smaller number of logical clusters. All the achievement items were combined into a single measure after the scales within each set of 40 or 43 items were examined. Linear combinations of conceptually related background variables, as well as first principle component scores computed for related background variables, were identified; and redundant and psychometrically weak variables were screened out before the major research questions were addressed.

Examining Scales Within the Achievement Items. Each item in the Supplementary Mathematics Probe falls into one of four mathematics objectives (also called "cognitive-process levels" and "behaviors/skills") and into one of eight content categories. (As a parenthetical note, the evolution of the classification of items into mathematics objectives and content categories has been to collapse the last named two. There were six mathematics objectives and 17 content categories for the 1972-73 assessment, but there were only four mathematics objectives and five content categories by the time of the 1977-78 assessment.) The classification system used by NAEP is an a priori one, whose primary purpose is to guide the development of exercises achievement (items).

When results of assessments are published, NAEP reports them by mathematics objective or content area, both. In the 1972-73 assessment and the 1977-78 assessment there were literally hundreds of exercises administered to 13- and 17-year-olds. With such a large number of items it seems appropriate to divide them into scales (i.e., into mathematics objectives and content categories) and even into subscales (i.e., mathematics objectives and content categories are crossed so that each cell in the resulting matrix creates a subscale).

There were only 83 items administered during the 1975-76 Special Mathematics Probe assessment: 43 in booklet 1 and 40 in booklet 2. The breakdown of these exercises into objectives and content categories is shown in Tables 2 and 3. The exercises are named with the letter "D" followed by a three digit number (e.g., "D242"). The letter "D" indicates that the multiple choice items from the Special Probe have been converted to dichotomous variables (right or wrong). The number refers to the position on the tape of the original multiple choice items, thus constitutes a reference system for identifying the item by its position on the tape.

During Phase I of this project we constructed a complete matrix of item correlations (using the SPSS subprogram PEARSON CORR) to obtain a quick look

at the psychometric properties of the scales (i.e., the mathematics objectives and the content categories). Those preliminary results suggested that the exercises did not cohere into scales well at all. In order to obtain a more exact description of scale coherence we examined the objectives and content categories scales using the SPSS subprogram RELIABILITY. The output from this program is shown in Table 4.

The reliabilities of all the items in each booklet as a whole are gratifyingly high (.92 for Booklet 1 and .89 for Booklet 2). The reliabilities for each of the scales are also very respectable--especially considering the small number of items in each scale, two of which have only three items. Nonetheless, it appears that scale reliability is based primarily on the number of items in each scale; (a notable exception is the "Numbers and Number Concepts" scale in Booklet 1). Therefore, because the purpose of this study was to identify contextual and attitudinal factors associated with achievement, and because respondents' total scores are the most reliable measures of their achievement, we decided to use total scores rather than scale scores in our analyses of the 1975-76 Special Probe.

Developing Scales from Background Variables. There are 11 sources of background information in the 1975-76 mathematics data, four of which were developed particularly for the special probe. These eleven data collectors are listed below:

1. School Principal's Questionnaire;

*2. Basic Mathematics Principal's Questionnaire;

3. Student Background Questions (also called "Respondent Questionnaire--End of Test Booklet" or "Tailsheet");

*4. Basic Math Student Background Questions (also called "Last Exercise");

*5. Supplementary Student Questionnaire;

*6. Opinions and Attitudes About Mathematics;

7. Derived Variables (Derived from Respondent Data);

8. Derived Data (Derived from Sources Other Than Respondent Data);

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* These four data collection instruments were developed for the 1975-76 Special Mathematics Probe.

9. Sampling Records;
10. School Records;
11. Observation by Test Booklet Administrator.

We developed 12 background composites based on over 120 variables selected from the information available in the above eleven sources. The 12 composites are as follows:

1. Academic Orientation;
2. Comfort/Confidence About Mathematics;
3. Community Characteristics;
4. Effort in Mathematics;
5. Extracurricular Activities;
6. Individual Program Variables (School Characteristics);
7. Locus of Control;
8. Math Courses Taken;
9. Personal Demographics;
10. School Program Variables (School Characteristics);
11. Self Esteem;
12. Television Watched.

Nine of the above composites were calculated as the simple sum of their components; for two of them a first principal component score was computed; and in one case a general linear model was fit to produce the composite variable.

What is perhaps the central problem in the design of the Supplementary Mathematics Probe is that the achievement items measure mathematics content and skills learned in grades 1-6, while many of the background variables describe respondents' experience in high school. For example, the Supplementary Student Questionnaire has 101 question and parts of questions. Of these 101, 60 questions or parts of questions relate solely to respondents' high school experience (e.g., "How often has watching television lectures been used in the courses you are taking this year?") Seven of the 101 questions relate to the respondents' experience in both grade school and high school (e.g., "Is a language other than English spoken in your home?") Thirty-six of the questions are difficult to categorize as being either high

school relevant or relevant to both grade school and high school (e.g., "How much schooling would your parents like you to get?")

Academic Orientation. While this cluster of variables is probably highly correlated with respondents' aptitude, there is no good measure of aptitude among the variables in this data file and thus we prefer the label "Academic Orientation." This composite was constructed by computing the first principal component for the following variables:

GRADES -- the respondent's grades "so far in high school," (e.g., "Mostly A," "About half A and half B," and so on);

PARTACTE -- whether the respondent participated in honorary clubs such as National Honor Society;

HSPROG -- whether the respondent is in an academic/college preparatory high school program;

FRAME -- whether the respondent is in school, is an early graduate, or is a dropout;

NVSCHEXP -- a scale developed by assigning the value 4 to respondents who expect to go to graduate school (SCHLEXPE), 3 to respondents who expect to go to four-year college/university (SCHLEXPD); 2 to respondents who expect to go to two-year/junior college or to vocational/technical/trade/business school (SCHLEXPC or SCHLEXPB); 1 to respondents who expect to graduate from high school (SCHLEXPA); and 0 to respondents with none of the above expectations for schooling.

Comfort/Confidence About Mathematics. There are nine items which ask respondents for their opinions and attitudes about mathematics ("Strongly agree, agree, undecided, disagree, strongly disagree"). These items are grouped together and embedded in the achievement items. Examples are "I try hard in mathematics;" and "I usually do well on mathematics tests and homework." A related question on the Supplementary Student Questionnaire is "Approximately what is the average amount of time you spend on homework a week?" Finally, there are four items on the "tailsheet" or "last exercise" which ask questions like "When you work math problems do you check the answers?" AIR conducted a factor analysis of these 14 items and found that there were two main factors. Eleven of the items loaded primarily on one or the other of them, and three items did not load well on either. Since the three items which did not fit well into the analysis were also somewhat ambiguous (i.e., difficult to interpret), we dropped the items.

Six items loaded on the first factor which we call "Comfort/Confidence About Mathematics." The loadings of these items ranged from .64 to .80. The composite corresponding to this factor was constructed by adding the components (i.e., forming a simple sum from the linear combination of the equally weighted items). The second factor, "Effort in Mathematics," is discussed below.

Community Characteristics. There are 12 standard NAEP variables, seven of which are measures of Personal Demographics. The remaining five are Community Characteristics and include the following:

CENSDIV -- Census Division; the nine categories are New England, Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain, and Pacific.

COMMSIZE -- Community Size (also Derived Size of Community, or DOC); the four categories are Big City, Big City Fringe, Medium City, and Small Places;

REGOBE -- Office of Business Economic Region; the four categories are Northeast, Southeast, Central, and West.

STOC -- Size-and-Type-of-Community; there are seven categories, three extreme ones and four residual categories. Extreme Rural defines the 10 percent of the total sample with the highest proportion of parents who are farmers and live in Small Places. Low Metro (Disadvantaged Urban) defines the 10 percent of the total sample with the highest proportion of parents who are unemployed or on welfare and live in Big Cities or Big City Fringes. High Metro (Advantaged Urban) defines the 10 percent of the total sample with the highest proportion of parents who are in professional or managerial positions and live in Big Cities or Big City Fringes. The four residual categories are the remaining 70 percent of the total sample living in Big Cities, Big City Fringes, Medium Cities, and Small Places.

TOC -- Type of Community; the three categories are the three extreme ones discussed above under "STOC." A fourth "other" category corresponds to all four STOC residual categories collapsed into one.

We did not use COMMSIZE or TOC preferring the variable STOC, which incorporates the information contained in both of these variables. Neither did we use REGOBE, preferring the more finely grained variable CENSDIV instead. In addition to the above two variables, we used the following:

PCTQT1 -- the percentage of students (by school) who qualify for Title I;

PCTWHITE -- the percentage of students (by school) who are white;

PCTPROFto PCTWELFR -- variables which are indicators (by school) of the occupational characteristics of students' parents;

PCTSOC1 to PCTSOC7 -- variables which are indicators (by school) of the size of the community in which students live.

We used a general linear model to compute a Community Characteristics composite from the above nominal variables. Mathematics achievement was used as the criterion variable. Each community was placed on a scale related to the apparent advantage to students from the community in which they lived as far as their mathematics achievement was concerned.

Effort in Mathematics. The analysis of 14 items which led to the construction of a five item "Effort in Mathematics" scale (as well as a six item "Comfort/Confidence About Mathematics" scale) is discussed above in the paragraphs on "Comfort/Confidence About Mathematics." The five items which loaded on factor 2 (which we call "Effort in Mathematics") ranged from .52 to .70. The scale which corresponds to this cluster of items was computed using the simple sum of the five items.

Extracurricular Activities. There are nine items in the Supplementary Student Questionnaire which ask respondents whether they have participated in athletics, cheerleading, music or drama, and so on. Respondents' answers to these items are coded in the following way: 0 for nonparticipation; 1 for participation; and 2 for participation as a leader. We extracted one of these--participation in honor societies--for inclusion in AIR's "Academic Orientation" composite. We factor analyzed the remaining eight items and noted three main points. First, all eight items are positively correlated with each other. Second, all eight load positively on the first factor of the analysis. Third, the loadings of the items on factor 1 range from .35 to .61, with four of the eight loadings between .53 and .55. Therefore it was judged that the most appropriate way to construct the extracurricular activities composite was to use all eight of the remaining items and to give them equal weight (i.e., to use the simple sum of these items).

Individual Program Variables (School Characteristics). There are 10 items on the Supplementary Student Questionnaire which ask respondents

information about their programs. The stem for all items is "How often has each of the following been used in the courses you are taking this year" (Never, Seldom, Fairly Often, Frequently)." Examples of the items are, "Listening to the teacher's lecture; "Participating in student-centered discussions;" and "Working on a project or in a laboratory." As with "Math Courses Taken," these variables refer to the respondents' circumstances in secondary school, while the respondents' achievement being measured reflects what they learned in elementary school. Three of the 10 items remained significantly correlated (at or below the .01 level) with achievement when the partial correlations--controlling for Community Characteristics, Personal Demographics and Academic Orientation--were examined. (See the discussion of "School Program Variables: School Characteristics" below.) It is our speculation that these three variables may be indirectly measuring aptitude, which would thus account for the small, but significant observed partial correlations. (There are no direct measures of aptitude in these data, although we would expect the Academic Orientation composite to be highly correlated with it.)

Locus of Control. There are eight items in the Supplementary Student Questionnaire which ask respondents how they feel about statements such as the following: "I take a positive attitude toward myself;" "Good luck is more important than hard work for success." It appeared from inspecting these items that they were designed to load on one of two factors: "Self Esteem" or "Locus of Control." To test this assumption we factor analyzed the eight items and saw that four of them loaded positively on one factor of the analysis; (the other four items loaded positively on the other factor). The range of the loadings on factor 2--whose underlying dimension is clearly "Locus of Control"--is from .53 to .73. The corresponding composite was constructed using a linear combination of the four items with equal weights. That is, the simple sum of the items defines the scale. The other factor, "Self Esteem," is discussed below.

Math Courses Taken. The "Math Courses Taken" scale measures only the topics studied by respondents in secondary school. The achievement items solely measure what the respondents learned in elementary school. For this reason, it makes little sense to think that "Math Courses Taken" would influence respondents' achievement, except to the extent that this variable is a proxy for "Academic Orientation." Indeed the correlation between these

two variables is .60. We believe that the most informative way to consider "Math Courses Taken" is as an outcome measure. Therefore we will examine which antecedent variables predict this outcome variable. This line of investigation seems particularly important in the light of research which shows that "Math Courses Taken" is one of the best predictors of subsequent mathematics achievement.

Personal Demographics. There are 12 Standard NAEP variables, five of which measure Community Characteristics. The other seven measure Personal Demographics and include the following:

COLLGRD -- the respondent's grade level, collapsed to the most frequent values (e.g., tenth, eleventh, twelfth);

COLLRAC3 -- the respondent's race or ethnicity collapsed to white, black, and other;

COLLRACE -- the respondent's race or ethnicity collapsed to white, black, Spanish heritage, and other;

HOMEENV -- a composite of the reading material available in the respondent's home (newspaper, magazines, books, encyclopedia);

MODALGR -- whether the respondent is in the grade in which the majority of that age group is enrolled;

PARED -- the highest level of either parent's education;

SEX -- the respondent's sex.

We did not use COLLGRD or MODALGR because the material being tested was covered in elementary school--not in the respondents' current grades--and because we wanted to include out-of-school respondents for whom COLLGRD is a missing value. Of the two variables which describe the respondent's race/ethnicity we chose COLLRACE which has four categories (one of which is "other"). We combined HOMEENV into a parents' socioeconomic status variable, called PARSES, which also includes the presence of a dictionary, the presence of a place in the respondent's home for study and various material possessions such as a color television, a typewriter, and a dishwasher. The composite PARSES was constructed by computing the first principal component of the above variables.

We retained NAEP's PARED variable separate from PARSES, because we believe it is related to parents' educational aspirations for respondents

relatively independently from parents' socioeconomic status. In addition to the above variables, plus SEX, we considered the following Personal Demographics variables:

MOBILITY -- a variable constructed from SCHSATTD, the number of different schools attended by the respondent since first grade, and from LIVDCOMM, the number of years the respondent has lived in the community;

AGEMONTH -- the respondent's age in months relative to the 17-year-olds in the sample, constructed from BIRTHMO (birth month) and BIRTHYR (birth year);

NONENGL -- a measure of whether English is the language spoken most often in the respondent's home (SPKENGL) or whether a language other than English is spoken in the home (OTHLANG).

School Program Variables (School Characteristics). There are seven items on the Basic Mathematics Principal's Questionnaire which ask about the presence or absence in each school of the following: computer-assisted instruction materials; standard math tests; individualized materials; "math labs;" manipulative materials (e.g., geoboards); calculators; and computers. None of these items were significantly associated with achievement when the partial correlations--controlling for Community Characteristics, Personal Demographics, and Academic Orientation--were examined.

Self Esteem. The analysis of eight items which led to the construction of a four item "Self Esteem" scale (as well as a four item "Locus of Control" Scale) is discussed above in the paragraph on "Locus of Control." The four items which loaded on factor 1 (which we call "Self Esteem") ranged from .71 to .79. This cluster is an unusually tight one, and the corresponding scale was computed using the simple sum of the four items.

Television Watched. This component is the single variable, TVWATCHD. The item asks respondents: "How much television did you watch last night?"

Developing and Testing Preliminary Models of Mathematics Achievement. The steps involved in our preliminary analyses were to draw a subsample of 1,000 records from each of the two samples (booklets) of 5,000 17-year-old repondents, to specify a preliminary model of achievement, and to investigate the preliminary model by examining partial correlations and regression analyses. These steps are discussed below.

We sorted both samples of 5,000 by parents' education, race, region, sex, and size and type of community, with a minor sort on achievement as well. We drew two systematic, random subsamples of 1,000 respondents by selecting a random starting point within the first five records and then selecting every fifth case. This procedure reduces the sampling error with respect to the stratification variables, although it makes the precise estimation of sampling errors more complicated. This latter complication was not considered to be a critical problem for the preliminary analyses.

In order to confirm that the subsamples of 1,000 were representative of the larger samples of 5,000 from which they were drawn, we ran the SPSS subprogram FREQUENCIES for both subsamples to compare selected demographic data for the subsamples to the demographic data for the complete samples. Eight standard NAEP variables and eight other variables identified in its publications by NAEP as being significant were selected. The comparisons can be seen in Table 8 below.

After developing the 12 composites of background variables (discussed above in the previous section) and drawing two subsamples of 1,000 records, we specified the preliminary model of mathematics achievement shown below in Figure 1.

Treatment of Missing Values

The presence of missing values in the questionaire items posed a particular problem for this study. Due to time constraints when the instrument was administered, a significant number of students did not answer all of the questionaire items. (The omit rate is as high as 40% for the last items.) Deleting a sizeable number of students from the analyses because they were missing one or two of the questionaire variables would have posed some threat to the generality of the results. Instead it was decided to impute values for all ommitted variables using PROC IMPUTE (Wise & McLaughlin 1980, 1981). PROC IMPUTE is a Statistical Analysis System (SAS) procedure designed to yield relatively unbiased estimates of variances and covariances while utilizing as much of the available information on each case as possible. Other packaged alternatives (e.g. BMDPAM) use a strict regression approach which leads to underestimates of variances and distortion of covariances.

Preliminary Models of Mathematics Achievement

The general approach employed in analyzing these data was to estimate a correlation coefficient matrix for the study variables and then to examine a series of partial correlations with key constructs controlled. Regression analyses were used to control for a number of variables simultaneously. The preliminary analyses were based on an exploratory analysis of the sample of 1,054 seventeen-year-olds who received Booklet 1 in the 1976 probe. Confirmatory analyses based on the full sample of 17-year-olds receiving Booklet 2 are described in the following section of this report.

Table 9 shows the first-order correlation of each of the main study variables with mathematics achievement, number of mathematics courses taken, and academic orientation. Partial correlations with math achievement and math taken controlling for obvious predictors are also shown in Table 9. Not surprisingly, the number of mathematics courses taken and academic orientation are far and away the strongest predictors of mathematics achievement. Both variables are obvious indicators of a high level of mathematics achievement prior to high school. In a longitudinal analysis of data from Project TALENT, Wise and Steel (1978) found a high correlation between ninth grade achievement scores and the number of mathematics courses subsequently taken in high school. Background variables, specifically Race, Parents Education and SES, and Community Characteristics (mostly race, SES, and community size) also show high correlations with math achievement scores at age 17.

Mathematics Achievement. In order to discover more interesting relationships between school characteristic, school program, and other individual characteristic variables, it is necessary to control for school and student differences in achievement levels. The fourth column of Table 9 shows partial correlations with math achievement after controlling for the more obvious predictors. These data indicate that the attitudinal variables are significant indicators of math achievement independent of the variables controlled. Math Confidence shows the highest partial correlation. The causal relationship is, of course, quite unclear and it would be a mistake to conclude that changing a student's math confidence level will necessarily increase math achievement. Math confidence may well reflect a student's accurate assessment of his or her achievement level. The best that can be said here is that the findings do not contradict widespread efforts to improvement achievement through reductions in "math anxiety."

The second attitudinal variable to show a significant partial correlation with math achievement is Locus of Control. Here there may be less reason to suppose that higher levels of internal control are simply a reflection (rather than a cause) of higher math achievement. Again, longitudinal studies with tighter contols are needed to adequately determine the appropriate causal relationship. The same may be said about the partial correlation with Math Effort, altough here the more plausible assumption is that greater effort does in fact lead to higher achievement.

None of the general school program variables showed a significant correlation with math achievment after students' background, academic orientation and number of courses taken were controlled. Several of the "student specific" variables did show significant partial correlations. Students who reported using calculators did have higher levels of math achievement after controlling for the main predictors. Likewise students who reported studying math functions and sets also showed higher levels of achievement. Since the number and general level of math courses was controlled, it seems plausible that these partial correlations reflect genuine differences in the quality of the curriculum rather than in the students' overall level of exposure to mathematics instruction.

Mathematics Courses Taken. Most of the predictors of the overall math achievement level were also strong predictors of the number of mathematics courses taken. These included academic orientation, background variables (with the surprising exception of Race), and the attitudinal variables math confidence, locus of control, and math effort. After controlling for background and academic orientation, the attudinal variables (math confidence, locus of control, and math effort) still showed significant partial correlations with the number of math courses taken.

At least one of the general school program variables showed a significant correlation with the number of courses taken. Whether computers were used in the school (COMPUSE) had a strongly significant first order correlation with the number of courses taken and at least a marginally significant partial correlation. The use of CAI materials also showed a marginally significant partial correlation with the number of courses taken. Finally, the "individual program" variables, (whether functions, sets, or metrics were studied) are clearly a reflection of the number and level of courses taken rather than a useful predictor.

Gender Differences. Tables 10a through 10d show the same correlations and partial correlations separately for each sex and for each race. On the whole, the main predictors show quite similar patterns of prediction for both sexes and for both Blacks and Whites. In comparing Tables 10a and 10b, a few gender differences of some significance may be noted. Math confidence was a stronger predictor of math achievement for females than for males, both before and after controlling for courses taken, academic orientiation, and background. Locus of Control was, conversely, a less significant predictor for females than for males. Math effort was also a somewhat less signficant predictor for females. The only other major gender difference was that participation in extracurricular activities had a significant negative partial correlation with achievement for females but not for males. With respect to the partial correlations with courses taken, Math Confidence was again a greater predictor for females than for males and math effort was a significant weaker predictor for females.

Table 11 shows the partial correlations of sex with math achievement after controlling for various variables. These data indicate the extent to which the variables controlled offer a plausible "explanation" of the gender differences in math achievement. All of the partial correlations remain significant except for the correlation with sex controlling for Math Confidence. This suggests that the correlation between sex and math achievement could be mediated by sex differences in math confidence. As noted above, however, sex differences in math confidence could be merely a reflection of the differences in achievement rather than being a causal mediator. One other variable, Self Esteem, does bring noticeable reduction in the correlation of sex with math achievement.

Race Differences. Tables 10c and 10d show the main study correlations and partial correlations separately for Blacks and for Whites. The race differences found in the correlations and partial correlations with achievement and courses taken were somewhat larger than the gender differences. In part this reflects greater differences in heterogeneity between the White and Black samples and also the noticeably smaller size of the Black sample. The greater differences are also consistent with the larger overall race differences in level of achievement, however. The main predictors of achievement, courses taken and academic orientation were significantly

weaker for Blacks, probably reflecting the smaller variability of achievement scores among Blacks (restriction of range). One difference of some note was that the general school program variables, COMPUSE and CAIMUSE, showed noticeably larger partial correlations with math achievement for Blacks although these correlations did not achieve statistical significance because of the small sample size.

The results in Table 11 indicate that none of the main study variables offer a plausible "explanation" of the race differences in math achievement. Some reduction in correlation is achieved when Parent's SES and Education are controlled, but the remaining differences are still wildly significant.

Summary. In general, background, academic orientation, and math courses taken were the clearest predictors of math achievement scores. After these variables were controlled, several attitudinal variables remained significant predictors of math achievment. Some of the individual program variables also showed small but significant partial correlations with math achievement. The predictors were generally the same for males and females although specific attitudinal variables were somewhat stronger predictors for one sex or the other. With respect to race, the main predictors were somewhat weaker for Blacks than for Whites, but the pattern of prediction was generally similar. Two general school program variables, the use of computers and of CAI materials, showed at least marginally significant partial correlations with the number of courses taken.

Confirmatory Analyses

The preliminary analysis sample of Booklet 1 examinees was used to identify specific hypotheses concerning predictors of mathematics achievement scores. In these analyses, several factors were identified that might contribute to race and sex differences in performance levels, and several school program factors were identified that showed a significant, although small, relationship to students' mathematics performance scores. Since these hypotheses were among a rather large number tested, it was essential that they be cross-validated to see if the specific factors identified would continue to be predictive in an independent sample.

The final analyses were based on the entire sample of students completing Booklet 2 (n=5324). These students received the same supplementary questionnaire items, but a different set of mathematics achievement items.

For purposes of this study, we are seeking predictors of general performance in mathematics rather than differential predictors of specific mathematics subskills. The use of a separate set of mathematics achievement items as well as a separate set of students is a further test of the generalizability of the preliminary findings.

Table 12 shows the correlations and partial correlations of the main study variables with math achievement and with math courses taken and academic orientation. It is parallel to Table 9 from the preliminary analyses. The correlations of the main predictors with math achievement are quite similar to those found in the preliminary analyses. The correlations with Community Characteristics are somewhat lower. This is not suprising, since a relatively large number of parameters were fit in developing the initial composite so that a greater amount of "shrinkage" was expected in this cross-validation. The pattern of partial correlations with math achievement is also quite similar to those found in the preliminary analysis. Math confidence and locus of control show the greatest partial correlations, although math effort shows a much lower level of partial correlation than in the original analysis. The same individual program variables, USEDCALC, MATHFUNC, and MATHSETS also showed significant partial correlations of about .1. The findings with respect to predictors of math courses taken are also confirmed. Math confidence, math effort, and locus control all have significant partial correlations with math courses taken, except that the correlation is slightly lower for locus of control in this cross-validation. The partial correlations with COMPUSE and CAIMUSE are almost exactly the same as in the preliminary analyses, although these same correlations are more significant statistically because of the greater sample size.

Tables 13a-13d show the main correlations and partial correlations separately for each sex and race. These tables correspond to Tables 10a-10d from the preliminary analyses. With respect to gender differences, all of the notable differences from the preliminary analysis disappeared in the cross-validation. There were no noticeable gender differences in the partial correlations of locus on control, math confidence, or math effort with math achievement. There was no (practically) significant correlation between participation in extracurricular activities and residual math achievement for females as in the preliminary analyses. With respect to Blacks, many of the suggested differences in relationships noted in the preliminary analyses

also disappeared. The main predictors did, again, show lower levels of correlation for Blacks, but some of the partial correlation with locus of control was actually significantly higher for Blacks in the cross-validation then for Whites. The partial correlations of achievement to COMPUSE and CAIMUSE were not significant or even negative in the second analyses.

Table 14 shows the partial correlations of sex and race with math achievement controlling for various study variables. It is comparable to Table 11 from the preliminary analyses. For sex, the correlation is reduced most when math confidence is controlled as in the preliminary analyses, but not nearly as much. Self esteem again yields the next largese reduction but here too the amount of the reduction is much less. The results for race are more highly comparable to the preliminary findings in degree as well as in pattern. Parents's Education and SES yield the greatest reduction in the correlation of race with achievement when controlled, but still leave a very sizeable relationship that is not "explained" at all by other study variables.

Implications of the Findings

The analyses described above are an illustration of just one kind of study that is made possible by the existence of the NAEP data. While any causal suggestions derived from this data are necessarily tentative, there are very few databases that even allow for the examination of the important relationships between student characteristics, school program characteristics and student performance levels. The scope of the background data in the supplementary probe and the size of the samples make it possible to obtain reliable estimates of the size of various predictive relationships.

The specific findings indicate some relationship between the availability of specialized equipment, specifically computers, and student interest as evidenced by the number and level of mathematics courses taken by students with similar academic orientations and backgrounds. Few other school program variables showed relationships that were clearly independent of student and community characteristics.

A few of the attitudinal variables also showed strong relationships with mathematics achievement even after background and academic orientation

variables were controlled. Students with higher scores on the (internal) locus of control scale and students with greater levels of "math confidence" tended to score higher independently of their academic orientation levels, the number of mathematics courses taken or their backgrounds.

The sex differences that were observed in mathematics achievement were potentially related to these attitudinal measures. That lower scoring females also exhibited lower levels of math confidence is not necessarily revealing since the direction of causality is totally confused. It is clear, however, that theory that efforts to reduce "math anxiety" can lead to increases in mathematics performance is not at all rejected by these data.

The very large race differences in mathematics achievment levels were not satisfactorily explained by any of the variables in this study. There were not very large race differences in the number of mathematics courses taken or their apparent level nor in level of academic orientation (which includes grades as a component). Further investigations, probably at an earlier age level, are clearly warrented.

The Utility of the Special Mathematics Probe Public-Use Tape and Its Documentation

One of the strengths of the public-use tapes is the thoroughness of their documentation. The consensus among the researchers present at the Second DeKalb NAEP Conference was that the tapes constitute the single best documented national data base, bar none. The discussion below is intended to be a constructive critique of the documentation for the public-use tapes. It may be useful to draw a distinction between "micro-documentation" and "macro-documentation." The former, at which NAEP excels, has to do with documentation at the level of variable labels, value labels, and the like. documentation at the level of variable labels, value labels, and the like. The second kind of documentation, macro-documentation, refers to the identification of the presence of social science constructs (e.g., locus of control, self esteem), the rationale for the inclusion of certain background information items (e.g., "I feel at ease in a mathematics class and I like it very much") and so on. It is on its macro-documentation that NAEP can be faulted. For example, questions 19A to 19H in the Supplementary Student Questionnaire divide neatly into four items which measure fate control (locus of control, fatalism), and another four items which measure self esteem (positive self image). There is no documentation stating that these two four-item scales are contained in the supplementary questionnaire. The two sets of four items are grouped together in the data collection form (and are next to each other on the data tape as well, being variables 196 to 203--"FEELABTA to FEELABTH"). While researchers would probably be able to identify these scales on the basis of their face validity, it requires time to inspect the items note the seeming presence of the two scales, and confirm the coherence of the two sets of items by factor analysis, or by some other statistical procedure. We feel the existence of these scales should be noted in the documentation; this would be an example of macro-documentation.

Ideally, the discussion of the scales could be taken one step further and the rationale for their inclusion in the questionnaire would be set forth. It seems clear from reading the User's Guide (especially version 2.0) and from talking to NAEP staff that before FEELABTA to FEELABTH were incorporated into the student questionnaire, the importance of their inclusion was probably discussed at one or more staff meetings, their expected

contribution to understanding respondents' backgrounds as well as their possible shortcomings were debated, and the items were probably also pilot-tested. This sort of detailed information about item selection would be valuable for researchers--and would benefit NAEP too, as explained below.

In October 1980, NAEP (through a grant from the National Institute of Education) sponsored an awards competition to test seven prototype public-use tapes developed from a single subject area (mathematics). An award was made to AIR and to eight other agencies. It had been NAEP's intention to increase the use made of the massive amounts of data it has collected, for example, to explore ways in which the data could be used in program planning at all levels of education--from the classroom to the federal Department of Education.

The research reported here is based on one of the seven version 1.0 public-use mathematics tapes. The process of conducting this research has been a rewarding one for us (and for the other eight award recipients, we suspect) because of the experience of trying a new kind of research methodology for the first time.

We believe the excitement generated during this round of research (for example, the award recipients have started a NAEP Special Interest Group within the American Educational Research Association) has been due in part to the collaborative relationship between the NAEP staff and the researchers using the tapes. That is, the research has been interactive in that NAEP has not only provided the tapes, with data files and a considerable amount of documentation, but has also repeatedly asked the researchers questions such as, "Did you have any problems reading the tapes? How do you feel about the order of the variables on the tapes?" and so on. The benefit from the communication between NAEP and the award recipients has been immediate. NAEP has already developed a set of version 2.0 public-use tapes based on the progress reports and other preliminary feedback from the researchers using the version 1.0 tapes. Thus, one of the purposes of the October 1980 request for proposals has already been achieved; the version 2.0 tapes indicate that NAEP has been able to "improve the medhodology by which national achievement data are ... analyzed and used." We believe that the key to the utility of the NAEP data base is in maintaining open channels of communication between NAEP and the researchers using its public-use tapes. This approach will undoubtedly result in more work for the NAEP staff and the

requirement to produce version 3.0 tapes, version 4.0 tapes, and so on, as new user needs are identified. But the rewards from this interactive approach are potentially great. We feel if future awards are carried out with the kind of interaction between NAEP staff and researchers characteristic of this round of research, that NAEP will be able to achieve its goals of "identifying ways to advance what is known about the quality of American education; and developing techniques for improving ways in which National Assessment is conducted."

At the beginning of this project we began keeping a file folder on problems which arose due to lack of clarity in the documentation of the data tape. In March, we sent a letter to NAEP with some suggestions for revisions in the User's Guide. That letter drew on the notes which had been collected in the documentation folder. At the time the letter was written, we chose to concentrate on general rather than specific issues and did not point out such details as the fact that the verb "ick" is not defined in the glossary. (An icked item is one which has been removed from a data tape because it is "icky.") There are a fair number of quirks of a similar nature in the documentation to which the researcher soon becomes accustomed; we have already forgotten our puzzled search for "S0221A" (i.e., exercise 21 in booklet 2 for 17-year-olds) whose icked fate was not documented.

One of the greatest lacks we felt at the beginning of the project was the absence of a cross-referenced index to the background variables especially those administered to 17-year-olds. Accordingly, we developed a three-part cross-referenced index to thes items (variables) sorted as follows: (a) alphabetically, by variable name; (b) numerically, by variable number (the variable order on the data tape); and (c) by data source. This index appears in Appendix A. We feel that such a cross-referenced index would be invaluable to a first-time explorer of the NAEP public-use data tapes.

TABLES AND FIGURES

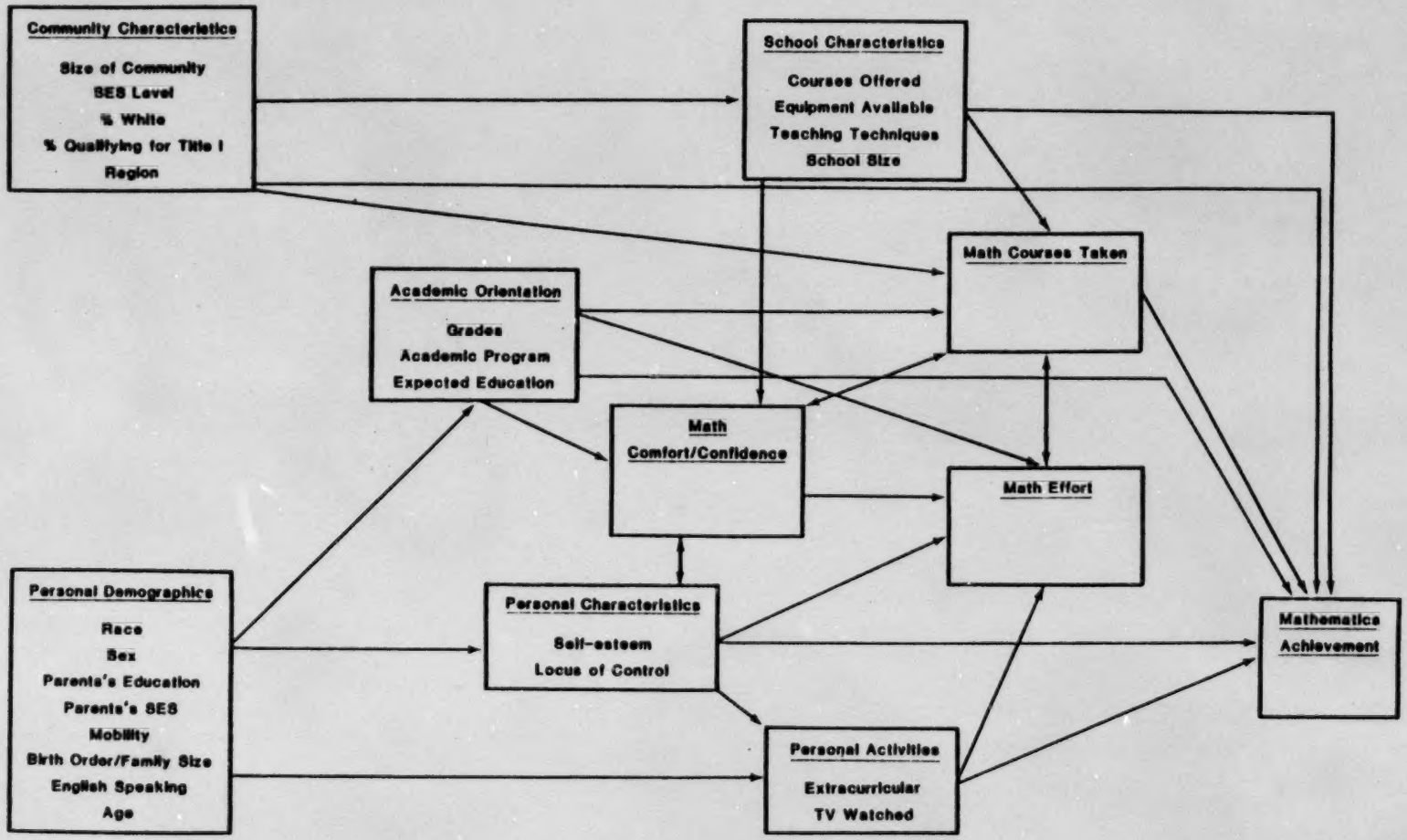

Figure 1. Preliminary model of mathematics achievement.

Table 1

Within Respondent Agreement on Three Pairs of Items by Booklet

	Booklet 1, 17-Year-Olds (N = 5,268)					Booklet 2, 17-Year-Olds (N = 5,324)				
	In-School	Follow-Up	Out-of-School	Total	Percent (Total)	In-School	Follow-Up	Out-of-School	Total	Percent (Total)
3 Complete Agreement	3,287	359	161	3,807	72.3	3,214	400	173	3,787	71.1
2 Agreement on 2 Points	747	90	86	923	17.5	774	125	96	995	18.7
1 Agreement on 1 Point	126	17	28	171	3.2	148	24	19	191	3.6
0 Complete Disagreement	306	52	9	367	7.0	309	36	6	351	6.6
Total	4,466	518	284	5,268	100.0	4,445	585	294	5,324	100.0

Table 2

Frequency and Cumulative Percentages of Missing Value and No Response Codes by Booklet

Missing Values

Number of Missing Values	13-Year-Olds Booklet 1		13-Year-Olds Booklet 2		17-Year-Olds Booklet 1		17-Year Olds Booklet 2	
	Freq.	Cum. %	Freq.	Cum. %	Freq.	Cum. %	Freq.	Cum. %
None	4959	98.8	4887	98.6	5224	99.2	5216	98.0
1	1	99.8	--	98.6	--	99.2	13	98.2
2	1	99.8	--	98.6	10	99.4	--	98.2
3	1	99.9	--	98.6	2	99.4	31	98.8
4	--	99.9	1	98.6	--	99.4	9	99.0
5	2	99.9	--	98.6	1	99.4	22	99.4
6-10	--	99.9	26	99.1	14	99.7	23	99.8
11-15	1	99.9	11	99.3	2	99.7	5	99.9
16-up	4	100.0	33	100.0	15	100.0	5	100.0
Total	4969		4958		5268		5324	

No Response

Number of No Responses	13-Year-Olds Booklet 1		13-Year-Olds Booklet 2		17-Year-Olds Booklet 1		17-Year-Olds Booklet 2	
	Freq.	Cum. %	Freq.	Cum. %	Freq.	Cum. %	Freq.	Cum. %
None	4585	92.3	4532	91.4	4736	89.9	4718	88.6
1	289	98.1	340	98.3	356	96.7	406	96.2
2	53	99.2	50	99.3	79	98.2	89	97.9
3	19	99.5	23	99.7	34	98.8	33	98.5
4	10	99.7	8	99.9	15	99.1	12	98.8
5	2	99.8	2	99.9	5	99.2	8	98.9
6-10	7	99.9	2	100.0	15	99.5	40	99.7
11-15	1	99.9	1	100.0	2	99.5	10	99.8
16-up	3	100.0	--	100.0	26	100.0	8	100.0
Total	4969		4958		5268		5324	

Table 3

Selected Background Information by Booklet

	13-Year-Olds Booklet 1	13-Year-Olds Booklet 2	17-Year-Olds Booklet 1	17-Year-Olds Booklet 2
1. Community Size:				
• Big City	21%	23%	17%	19%
• Fringes of Big City	15%	15%	16%	16%
• Medium City	13%	10%	12%	13%
• Smaller Places	51%	52%	55%	52%
2. Minority Students:				
• None	15%	14%	12%	12%
• 1 - 10%	40%	41%	46%	45%
• 11 - 20%	14%	13%	18%	17%
3. Students Qualifying for Title I:				
• None	41%	39%	50%	52%
• 1 - 9%	10%	11%	15%	17%
• 10 - 19%	13%	14%	12%	13%
4. Region:				
• Northeast	26%	25%	25%	25%
• Southeast	25%	24%	24%	24%
• Central	27%	28%	29%	29%
• West	22%	23%	22%	22%
5. Type of Community:				
• Advantaged Urban	10%	10%	8%	9%
• Disadvantaged Urban	9%	11%	9%	10%
• Extreme Rural	10%	11%	10%	9%
6. Students who have used calculators:	69%	69%	77%	76%
7. Grade:				
• Age 13 - 7th	27%	26%		
• Age 13 - 8th (modal)	71%	71%		
• Age 17 - 10th			13%	13%
• Age 17 - 11th (modal)			69%	70%
• Age 17 - 12th			11%	10%
8. Students Taught Metrics:				
• In Math Class	47%	47%	39%	40%
• In Any Class	73%	70%	69%	67%
9. Sex: Number of Boys	50%	51%	48%	49%
10. Number of Publications in the Home (out of four):				
• Four	54%	53%	63%	63%
• Three	27%	26%	22%	22%
• Zero to Two	19%	21%	15%	15%

Table 3 (continued)

	13-Year-Olds Booklet 1	13-Year-Olds Booklet 2	17-Year-Olds Booklet 1	17-Year-Olds Booklet 2
11. Parents' Education:				
• Some College	40%	39%	42%	42%
• High School Graduate	30%	29%	32%	32%
• Not High School Graduate	14%	15%	19%	18%
• Unknown	16%	17%	7%	8%
12. Time Spent on Homework (per week):				
• None Assigned/Done	no data	no data	14%	14%
• Up to 5 Hours	no data	no data	50%	49%
• 5 - 10 Hours	no data	no data	28%	28%
13. Time Spent Watching TV (one night)				
• None	no data	no data	28%	27%
• Up to 1 Hour	no data	no data	19%	20%
• 1 - 2 Hours	no data	no data	19%	20%
14. Other Languages Spoken at Home:				
• Often	no data	no data	6%	6%
• Sometimes	no data	no data	24%	25%
15. Race (collapsed):				
• White	no data	no data	83%	83%
• Black	no data	no data	11%	11%
• Hispanic	no data	no data	4%	4%
• Other	no data	no data	2%	2%
16. Educational Expectations:				
• Graduate High School	no data	no data	83%	82%
• Attend 2 Year College	no data	no data	25%	26%
• Attend 4 Year College	no data	no data	38%	39%

Note. In some cases percentages do not sum to 100 percent due to the omission of "other" categories. In other cases, percentages sum to more than 100 percent due to the possibility of multiple responses. Out-of-school 17-year-olds are omitted from the variable Grade.

Table 4

Average P-Values for 18 Common Basic Mathematics Exercises

	1972-73	1975-76	1977-78
17-year-olds	82%	80%	80%
13-year-olds	68%	66%	65%
	N=2,500	N=5,000	N=2,500

Note. The Ns are approximate due to variations in sample sizes

The decline in basic mathematics for 17-year-olds from 1973 to 1978 was two points compared to a decline in all areas of four points. For 13-year-olds, the decline in basic mathematics was three points compared to an overall decline of two points. For both groups the decline was greater from 1973 to 1976 than it was from 1976 to 1978.

TABLE 5

Booklet 1, 17-year-olds:

Mathematics Objectives by Mathematics Content Categories Matrix

Mathematics Content Categories	Recognize Facts Definitions Symbols	Perform Mathematical Manipulations	Understand Mathematical Concepts and Processes	Solve Mathematical Problems	Row Totals
Numbers and Number Concepts	D280		D274	D243	3
Numbers and Number Operations	D248	D242 D278 D279	D244 D277 D265 D266	D262	9
Arithmetic Computations		D246	D249	D250 D275 D276	5
Measurement and Estimation	D283	D263 D264 D287		D260 D284 D285	7
Mathematical Sentences	D261	D272 D288 D289		D286 D290	6
Geometry	D267	D245 D281 D282	D247	D270	6
Statistics and Graphs		D291	D259 D273 D292		4
Personal and Consumer Mathematics		D271		D268 D269	3
Column Totals	5	15	10	13	Total 43

TABLE 6

Booklet 2, 17-year-olds:

Mathematics Objectives by Mathematics Content Categories Matrix

Mathematics Content Categories	Recognize Facts Definitions Symbols	Perform Mathematical Manipulations	Understand Mathematical Concepts and Processes	Solve Mathematical Problems	Row Totals
Numbers and Number Concepts	D250 D251 D289	D242 D278	D269 D270 D271		8
Numbers and Number Operations	D256			D248 D274	3
Arithmetic Computations		D243 D268 D244 D280 D245 D281			6
Measurement and Estimation	D282			D246 D273 D276	4
Mathematical Sentences	D283	D258	D249 D267	D277	5
Geometry	D247 D257		D272	D275 D284	5
Statistics and Graphs			D254 D255	D279 D285 D286	5
Personal and Consumer Mathematics				D252 D288 D253 D287	4
Column Totals	8	9	8	15	Total 40

TABLE 7

The Reliability of the 1975-76 NAEP Content Category Scales, Mathematics Objectives Scales, and Total Booklets by Booklet

	Booklet 1		Booklet 2	
Mathematics Content Categories	Cronbach's Alpha	Number of Items	Cronbach's Alpha	Number of Items
Numbers and Number Concepts	.68	3	.68	8
Numbers and Number Operations	.72	9	.44	3
Arithmetic Computations	.57	5	.52	6
Measurement and Estimation	.66	7	.43	4
Mathematical Sentences	.71	6	.62	5
Geometry	.72	6	.51	5
Statistics and Graphs	.52	4	.38	5
Personal and Consumer Mathematics	.47	3	.43	4
Mathematics Objectives				
Recognize Facts, Definitions, and Symbols	.58	5	.65	8
Perform Mathematical Manipulations	.81	15	.69	9
Understand Math Concepts and Processes	.76	10	.62	8
Solve Mathematical Problems	.81	13	.73	15
Total Booklet	.92	43	.89	40

Table 8

Selected 17-Year-Old Demographic Data by Booklet and by Subsample

Six Standard NAEP Variables and 10 Other Selected Variables	NAEP's 17-Year-Olds Booklet 1 N = 5,268	AIR's Booklet 1 Subsample N = 1,054	NAEP's 17-Year-Olds Booklet 2 N = 5,324	AIR's Booklet 2 Subsample N = 1,065
1. Community Size:				
o Big City	17%	18%	19%	18%
o Fringes of Big City	16%	15%	16%	16%
o Medium City	12%	12%	13%	13%
o Smaller Places	55%	55%	52%	52%
2. Minority Students in School:				
o None	12%	13%	12%	10%
o 1 - 10%	46%	45%	45%	45%
o 11 - 20%	18%	18%	17%	18%
o 21 - 30%	6%	6%	7%	7%
3. Students Qualifying for Title I:				
o None	50%	48%	52%	53%
o 1 - 9%	15%	16%	17%	18%
o 10 - 19%	12%	13%	12%	11%
o 20 - 29%	8%	9%	6%	6%
4. Region:				
o Northeast	25%	25%	25%	25%
o Southeast	24%	24%	24%	25%
o Central	29%	29%	29%	29%
o West	22%	22%	22%	22%
5. Size and Type of Community:				
o Extreme Rural	10%	10%	9%	9%
o Disadvantaged Urban	9%	9%	10%	10%
o Advantaged Urban	8%	8%	9%	9%
o Main Big City	7%	7%	8%	8%
o Urban Fringe	8%	8%	8%	9%
o Medium City	12%	12%	13%	13%
o Small Places	45%	45%	43%	43%
6. Students Who Have Used Calculators:	77%	79%	76%	75%
7. Grade:				
o Age 17 - 10th	13%	13%	13%	15%
o Age 17 - 11th (modal)	69%	70%	70%	68%
o Age 17 - 12th	11%	10%	10%	9%
8. Students Taught Metrics:				
o In Math Class	39%	39%	40%	43%
o In Any Class	69%	68%	67%	69%

Table 8 (continued)

Six Standard NAEP Variables and 10 Other Selected Variables	NAEP's 17-Year-Olds Booklet 1 N = 5,268	AIR's Booklet 1 Subsample N = 1,054	NAEP's 17-Year-Olds Booklet 2 N = 5,324	AIR's Booklet 2 Subsample N = 1,065
9. Sex: Number of Boys	48%	48%	49%	49%
10. Number of Publications in the Home (out of four):				
o Four	63%	63%	63%	62%
o Three	22%	23%	22%	22%
o Zero to Two	15%	15%	15%	16%
11. Parents' Education:				
o Some College	42%	42%	42%	42%
o High School Graduate	32%	33%	32%	32%
o Not High School Graduate	19%	18%	18%	18%
o Unknown	7%	7%	8%	8%
12. Time Spent on Homework (per week):				
o None Assigned/Done	14%	14%	14%	13%
o Up to 5 Hours	50%	49%	49%	49%
o 5 - 10 Hours	28%	28%	28%	29%
13. Time Spent Watching TV (one night)				
o None	28%	28%	27%	26%
o Up to 1 Hour	19%	17%	20%	21%
o 1 to 2 Hours	19%	21%	20%	20%
14. Other Languages Spoken at Home:				
o Often	6%	6%	6%	6%
o Sometimes	24%	25%	25%	25%
15. Race (collapsed):				
o White	83%	83%	83%	83%
o Black	11%	10%	11%	11%
o Hispanic	4%	5%	4%	4%
o Other	2%	2%	2%	2%
16. Educational Expectations:				
o Graduate High School	83%	83%	82%	82%
o Attend 2 Year College	25%	26%	26%	24%
o Attend 4 Year College	38%	37%	39%	40%

Note. In some cases percentages do not sum to 100 percent due to the omission of "other" categories or because of rounding. In other cases, percentages sum to more than 100% due to the possibility of multiple responses or because of rounding. Out-of-school 17-year-olds are omitted from the variable Grade.

TABLE 9
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 1054 Booklet 1 examinees)

Controlling for:	Mathematics Achievement						Math Courses Taken			Acad. Ornt
	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd	-
RACE	0.39652 0.0001	0.42420 0.0001	0.43204 0.0001	-	-	-000	0.09969 0.0012	-	-	0.10165 0.0010
SEX SEX	-0.08646 0.0050	-0.12320 0.0001	-0.17091 0.0001	-	-	-	0.01795 0.5605	-	-	0.09700 0.0016
NONENGL	-0.13917 0.0001	-0.19580 0.0001	-0.20006 0.0001	-	-	-	0.02567 0.4051	-	-	-0.00662 0.8301
PARED PARENTS EDUCATION	0.40026 0.0001	0.23716 0.0001	0.17982 0.0001	-	-	-	0.34758 0.0001	-	-	0.35249 0.0001
PARSES	0.31380 0.0001	0.24244 0.0001	0.17810 0.0001	-	-	-	0.19945 0.0001			0.28851 0.0001
COMMCHAR	0.44277 0.0001	0.39480 0.0001	0.38919 0.0001	-	-	-	0.21328 0.0001	-	-	0.18871 0.0001
NSIBS	-0.16467 0.0001	-0.12320 0.0001	-0.09624 0.0018	-	-	-	-0.10986 0.0004	-	-	-0.13846 0.0001
ACADORNT	0.56661 0.0001	0.29677 0.0001	-	-	0.47674 0.0001	0.12495 0.0001	0.54242 0.0001	0.42208 0.0001	0.08153 0.0081	1.00000 0.0000
MOBILITY	-0.00683 0.8247	-0.02860 0.3537	-0.01442 0.6400	0.00971 0.7528	0.01088 0.7242	0.00053 0.9862	0.02580 0.4027	0.02199 0.4758	0.01392 0.6518	-0.02192 0.4771
AGEMONTH	-0.03268 0.2892	-0.05053 0.1011	-0.05148 0.0948	-0.04608 0.1349	-0.01648 0.5931	-0.02592 0.4006	0.01191 0.6993	0.03066 0.3200	0.02911 0.3451	0.00084 0.9783
TVWATCHD TV WATCHED LAST NITE	-0.18018 0.0001	-0.11933 0.0001	-0.10113 0.0010	-0.04094 0.1841	-0.07930 0.0100	-0.06929 0.0245	-0.14023 0.0001	-0.06974 0.0236	-0.05823 0.0588	-0.13484 0.0001
PARTACTV	0.04214 0.1716	-0.02384 0.4394	-0.10333 0.0008	-0.07573 0.0139	0.02857 0.3542	-0.08779 0.0043	0.09970 0.0012	0.06361 0.0389	-0.03982 0.1965	0.22728 0.0001
LOCUSCON	0.44363 0.0001	0.29400 0.0001	0.22888 0.0001	0.18442 0.0001	0.34495 0.0001	0.23779 0.0001	0.34500 0.0001	0.25641 0.0001	0.13997 0.0001	0.37709 0.0001
SELFESTM	0.11491 0.0002	-0.00211 0.9454	-0.06120 0.0470	-0.04759 0.1226	0.10585 0.0006	-0.06682 0.0301	0.19054 0.0001	0.16377 0.0001	0.01058 0.7315	0.23450 0.0001
MATHCONF	0.32025 0.0001	0.20199 0.0001	0.18494 0.0001	0.24263 0.0001	0.37137 0.0001	0.26820 0.0001	0.26230 0.0001	0.27168 0.0001	0.15703 0.0001	0.21117 0.0001

The entries are the correlation or partial correlation followed by the significance level.

TABLE 9
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 1054 Booklet 1 examinees)

Controlling for:	Mathematics Achievement						Math Courses Taken			Acad. Ornt.
	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd	-
MATHEFFT	0.27494 0.0001	0.09543 0.0019	-0.00466 0.8800	0.09859 0.0014	0.31097 0.0001	0.13248 0.0001	0.32599 0.0001	0.28504 0.0001	0.11188 0.0003	0.41415 0.0001
MATHTKN	0.61183 0.0001	0.00000 1.0000	-0.00000 1.0000	-0.00000 1.0000	0.52935 0.0001	0.34207 0.0001	1.00000 0.0000	0.92139 0.0001	0.80087 0.0001	0.54242 0.0001
CALCUSE	0.06900 0.0251	0.09650 0.0017	0.09280 0.0026	0.04495 0.1448	0.02134 0.4890	0.02124 0.4909	-0.01199 0.6974	-0.03134 0.3094	-0.03956 0.1994	0.01653 0.5920
COMPUSE	0.08738 0.0045	0.01886 0.5409	0.01918 0.5339	0.00959 0.7559	0.04835 0.1167	0.02180 0.4795	0.11845 0.0001	0.07683 0.0126	0.05592 0.0696	0.06642 0.0311
CAIMUSE	0.05281 0.0866	0.02336 0.4487	0.03631 0.2389	0.00587 0.8491	0.01220 0.6923	0.03562 0.2479	0.05611 0.0686	0.03373 0.2739	0.05868 0.0568	0.00520 0.8661
INDMUSE	-0.00318 0.9179	0.00555 0.8572	0.01003 0.7449	0.03469 0.2606	0.01558 0.6135	0.01714 0.5783	-0.01237 0.6883	-0.01349 0.6619	-0.01655 0.5915	-0.01584 0.6075
MNIPUSE	0.01806 0.5580	0.01525 0.6209	0.01335 0.6650	0.01841 0.5505	0.01917 0.5341	0.01265 0.6816	0.00981 0.7504	0.01034 0.7373	0.00276 0.9288	0.01188 0.7001
MATHLUSE	0.02838 0.3573	0.00958 0.7560	-0.00496 0.8722	0.00875 0.7767	0.03315 0.2823	0.02754 0.3717	0.03400 0.2701	0.02456 0.4257	0.01773 0.5652	0.05227 0.0899
STEXTUSE	0.00784 0.7993	0.04664 0.1303	0.04106 0.1829	0.03361 0.2757	0.02496 0.4182	0.03613 0.2412	-0.04748 0.1235	-0.01908 0.5361	-0.01553 0.6145	-0.00620 0.8408
USEDCALC HAVE USED CALCULATOR	0.24858 0.0001	0.21152 0.0001	0.18427 0.0001	0.11893 0.0001	0.15734 0.0001	0.11524 0.0002	0.13282 0.0001	0.07656 0.0129	0.02370 0.4422	0.16512 0.0001
MATHFUNC STUDY FNS IN MATH	0.31213 0.0001	0.14061 0.0001	0.13384 0.0001	0.09681 0.0017	0.24927 0.0001	0.18833 0.0001	0.32836 0.0001	0.28804 0.0001	0.23474 0.0001	0.21474 0.0001
TAUTMETH TAUT METRIC SYS-MATH	0.00764 0.8044	0.02919 0.3438	0.01435 0.6416	-0.00233 0.9398	-0.00592 0.8478	-0.02011 0.5143	-0.02525 0.4129	-0.02955 0.3378	-0.04628 0.1332	0.02378 0.4405
TAUTMET TAUGHT METRIC SYSTEM	0.19629 0.0001	0.07059 0.0219	0.04007 0.1936	0.01781 0.5636	0.13795 0.0001	0.05932 0.0542	0.22957 0.0001	0.17743 0.0001	0.10880 0.0004	0.20324 0.0001
MATHSETS STUDY SETS IN MATH	0.28098 0.0001	0.16309 0.0001	0.15577 0.0001	0.10738 0.0005	0.20811 0.0001	0.16703 0.0001	0.22255 0.0001	0.18255 0.0001	0.13921 0.0001	0.20958 0.0001

TABLE 9
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 1054 Booklet 1 examinees)

Controlling for:	Mathematics Achievement						Math Courses Taken			Acad. Ornt.
	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd	-
LECTURE	0.19169	0.09956	0.05440	0.05214	0.15377	0.09390	0.18460	0.14064	0.08143	0.21587
HOW OFTEN LECTURE	0.0001	0.0012	0.0775	0.0907	0.0001	0.0023	0.0001	0.0001	0.0082	0.0001
DISCUSS	0.10856	0.03866	-0.00871	0.02881	0.12796	0.04547	0.12745	0.11981	0.04051	0.18045
HOW OFTEN DISCUSS	0.0004	0.2098	0.7776	0.3501	0.0001	0.1401	0.0001	0.0001	0.1888	0.0001
PROJECT	0.25276	0.13622	0.09386	0.08708	0.21503	0.12855	0.23701	0.19661	0.11122	0.24370
HOW OFT WK ON PROJCT	0.0001	0.0001	0.0023	0.0047	0.0001	0.0001	0.0001	0.0001	0.0003	0.0001
WRITING	0.15537	0.04015	0.01339	0.03500	0.13618	0.05754	0.20204	0.16339	0.09292	0.17529
HOW OFTEN WRITE	0.0001	0.1928	0.6642	0.2563	0.0001	0.0618	0.0001	0.0001	0.0025	0.0001
FLDTRIPS	-0.07832	-0.08294	-0.08188	-0.02614	-0.01049	-0.01777	-0.02079	0.01723	0.01471	-0.02636
HOW OFTEN FLD TRIPS	0.0110	0.0071	0.0078	0.3966	0.7338	0.5643	0.5002	0.5763	0.6333	0.3926
INDIVINS	-0.00584	-0.05635	-0.09293	-0.06701	0.00624	-0.04825	0.06331	0.06205	0.01960	0.10708
HOW OFT INDIV INSTRT	0.8498	0.0674	0.0025	0.0296	0.8396	0.1174	0.0399	0.0440	0.5250	0.0005
MACHINST	-0.01922	-0.05958	-0.06447	-0.03098	0.00351	-0.00878	0.04560	0.04941	0.04484	0.02649
HOW OFT MACH INSTRT	0.5330	0.0532	0.0364	0.3149	0.9093	0.7760	0.1390	0.1089	0.1458	0.3902
TVLECTUR	-0.09233	-0.09277	-0.08477	-0.05175	-0.05567	-0.05324	-0.03097	-0.01327	-0.00410	-0.04882
HOW OFT TV LECTURE	0.0027	0.0026	0.0059	0.0931	0.0708	0.0840	0.3151	0.6669	0.8942	0.1132
TEXTBKS	0.23071	0.14187	0.08351	0.08848	0.19576	0.09789	0.19367	0.14807	0.04785	0.25665
HOW OFT USE TEXTBOOK	0.0001	0.0001	0.0067	0.0040	0.0001	0.0015	0.0001	0.0001	0.1205	0.0001
LIBRARY	0.07949	0.00281	-0.04388	-0.01188	0.08991	-0.00227	0.12628	0.11416	0.03106	0.17282
HOW OFT USE LIBRARY	0.0098	0.9273	0.1546	0.7001	0.0035	0.9413	0.0001	0.0002	0.3137	0.0001

TABLE 10a
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 503 Males receiving Booklet 1)

Controlling for:	Mathematics Achievement						Math Courses Taken		
	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
RACE	0.37720	0.39608	0.40102	-0.04690	-0.01874	-0.03029	0.10380	0.01914	0.01373
	0.0001	0.0001	0.0001	0.2938	0.6750	0.4979	0.0199	0.6684	0.7587
NONENGL	-0.14893	-0.22416	-0.23004	-0.01231	0.00160	0.00191	0.04542	0.02464	0.02818
	0.0008	0.0001	0.0001	0.7831	0.9715	0.9659	0.3094	0.5814	0.5284
PARED	0.41279	0.26070	0.20199	0.01776	0.01341	0.03033	0.33382	-0.00728	0.00562
PARENTS EDUCATION	0.0001	0.0001	0.0001	0.6911	0.7642	0.4974	0.0001	0.8706	0.9000
PARSES	0.30750	0.21688	0.15922	0.01395	0.02610	0.03467	0.21976	0.03383	0.04286
	0.0001	0.0001	0.0003	0.7549	0.5593	0.4378	0.0001	0.4490	0.3374
COMMCHAR	0.40848	0.36014	0.36374	-0.03252	-0.02866	-0.02563	0.20010	0.00084	0.00797
	0.0001	0.0001	0.0001	0.4667	0.5213	0.5663	0.0001	0.9849	0.8586
NSIBS	-0.15942	-0.11617	-0.07156	0.01346	-0.01762	-0.01804	-0.10918	-0.01802	-0.01840
	0.0003	0.0091	0.1090	0.7632	0.6933	0.6866	0.0143	0.6868	0.6806
ACADORNT	0.57686	0.30280	0.01045	-0.00223	0.47477	0.15036	0.54490	0.42915	0.11654
	0.0001	0.0001	0.8152	0.9602	0.0001	0.0007	0.0001	0.0001	0.0089
MOBILITY	-0.01513	-0.01712	0.01710	0.04513	0.00611	0.02582	-0.00259	-0.00410	0.01293
	0.7349	0.7016	0.7020	0.3124	0.8913	0.5634	0.9538	0.9269	0.7723
AGEMONTH	-0.07253	-0.11950	-0.10981	-0.09930	-0.04487	-0.06849	0.03528	0.06586	0.05951
	0.1042	0.0073	0.0137	0.0259	0.3152	0.1250	0.4298	0.1402	0.1827
TVWATCHD	-0.14583	-0.09830	-0.10771	-0.03016	-0.04876	-0.08101	-0.11004	-0.05790	-0.08925
TV WATCHED LAST NITE	0.0010	0.0275	0.0157	0.4997	0.2751	0.0695	0.0135	0.1948	0.0454
PARTACTV	0.04160	0.00069	-0.06156	-0.03413	0.05332	-0.03259	0.06626	0.05990	-0.01997
	0.3518	0.9877	0.1681	0.4450	0.2326	0.4658	0.1378	0.1798	0.6549
LOCUSCON	0.46973	0.34630	0.27193	0.23743	0.39582	0.31112	0.31658	0.24373	0.14126
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0015
SELFESTM	0.10921	0.00955	-0.06210	-0.00487	0.13667	-0.03076	0.16406	0.14782	-0.00820
	0.0143	0.8309	0.1643	0.9133	0.0021	0.4913	0.0002	0.0009	0.8545
MATHCONF	0.29859	0.17232	0.13511	0.21783	0.34937	0.25338	0.26219	0.25071	0.14538
	0.0001	0.0001	0.0024	0.0001	0.0001	0.0001	0.0001	0.0001	0.0011
MATHEFFT	0.32884	0.10867	0.01498	0.11002	0.36089	0.19197	0.39213	0.35180	0.19064
	0.0001	0.0148	0.7376	0.0136	0.0001	0.0001	0.0001	0.0001	0.0001

TABLE 10a
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 503 Males receiving Booklet 1)

Controlling for:	Mathematics Achievement						Math Courses Taken		
	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
MATHTKN	0.61325	-0.00815	-0.00560	-0.00267	0.52782	0.35786	1.00000	0.92567	0.82032
	0.0001	0.8553	0.9002	0.9524	0.0001	0.0001	0.0000	0.0001	0.0001
CALCUSE	0.03298	0.08424	0.08081	0.03067	-0.01177	0.02553	-0.05416	-0.07001	-0.04320
	0.4605	0.0590	0.0702	0.4925	0.7923	0.5678	0.2253	0.1168	0.3336
COMPUSE	0.04230	0.01407	0.01620	0.01650	0.01085	0.00929	0.05033	0.00615	0.00397
	0.3437	0.7529	0.7171	0.7120	0.8082	0.8354	0.2599	0.8906	0.9292
CAIMUSE	0.07777	0.06136	0.06526	0.03469	0.01232	0.05588	0.04729	-0.01062	0.02695
	0.0814	0.1694	0.1439	0.4376	0.7828	0.2109	0.2898	0.8122	0.5464
INDMUSE	-0.02084	-0.01494	-0.00849	0.04317	0.02225	0.03085	-0.01458	-0.00972	-0.00625
	0.6410	0.7382	0.8494	0.3340	0.6186	0.4900	0.7442	0.8279	0.8888
MNIPUSE	0.00637	0.02957	0.01931	0.04645	0.02916	0.03391	-0.02740	-0.02208	-0.02498
	0.8866	0.5082	0.6657	0.2985	0.5140	0.4480	0.5398	0.6213	0.5762
MATHLUSE	0.04087	0.01313	-0.00961	0.01580	0.03997	0.04520	0.04922	0.02257	0.02488
	0.3603	0.7690	0.8297	0.7236	0.3711	0.3116	0.2705	0.6135	0.5778
STEXTUSE	0.00119	0.00951	0.00850	0.03538	0.03633	0.04680	-0.01020	0.01321	0.01962
	0.9787	0.8315	0.8492	0.4285	0.4162	0.2949	0.8195	0.7676	0.6607
USEDCALC	0.21134	0.17974	0.16156	0.09952	0.12714	0.09859	0.11193	0.06174	0.02523
HAVE USED CALCULATOR	0.0001	0.0001	0.0003	0.0256	0.0043	0.0270	0.0120	0.1668	0.5724
MATHFUNC	0.30020	0.13765	0.11624	0.08652	0.24050	0.19651	0.30898	0.26613	0.22754
STUDY FNS IN MATH	0.0001	0.0020	0.0091	0.0525	0.0001	0.0001	0.0001	0.0001	0.0001
TAUTMETM	-0.04796	-0.01529	-0.04541	-0.05311	-0.05477	-0.06711	-0.05790	-0.06254	-0.07500
TAUT METRIC SYS-MATH	0.2830	0.7323	0.3094	0.2345	0.2201	0.1328	0.1948	0.1614	0.0929
TAUTMET	0.15973	0.02344	-0.00805	-0.02025	0.10732	0.04186	0.22788	0.17834	0.12653
TAUGHT METRIC SYSTEM	0.0003	0.5999	0.8571	0.6505	0.0160	0.3488	0.0001	0.0001	0.0045
MATHSETS	0.29819	0.17144	0.15041	0.12648	0.25280	0.21385	0.26266	0.23245	0.19204
STUDY SETS IN MATH	0.0001	0.0001	0.0007	0.0045	0.0001	0.0001	0.0001	0.0001	0.0001
LECTURE	0.20993	0.10550	0.06491	0.04604	0.16023	0.11459	0.20430	0.16170	0.11847
HOW OFTEN LECTURE	0.0001	0.0179	0.1460	0.3028	0.0003	0.0101	0.0001	0.0003	0.0078
DISCUSS	0.14263	0.06770	0.04150	0.05181	0.14154	0.06510	0.14386	0.13230	0.05874
HOW OFTEN DISCUSS	0.0013	0.1294	0.3530	0.2461	0.0015	0.1449	0.0012	0.0029	0.1884

TABLE 10a
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 503 Males receiving Booklet 1)

Controlling for:	Mathematics Achievement						Math Courses Taken		
	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
PROJECT	0.29077	0.16971	0.14540	0.13368	0.23652	0.19472	0.25289	0.19639	0.15058
HOW OFT WK ON PROJCT	0.0001	0.0001	0.0011	0.0027	0.0001	0.0001	0.0001	0.0001	0.0007
WRITING	0.21707	0.12735	0.10696	0.09759	0.17914	0.11056	0.18795	0.14732	0.07779
HOW OFTEN WRITE	0.0001	0.0042	0.0164	0.0286	0.0001	0.0131	0.0001	0.0009	0.0813
FLDTRIPS	-0.10141	-0.11384	-0.10922	-0.07111	-0.06902	-0.06957	-0.01853	-0.00550	0.00321
HOW OFTEN FLD TRIPS	0.0229	0.0106	0.0143	0.1112	0.1221	0.1191	0.6784	0.9020	0.9427
INDIVINS	-0.04119	-0.09706	-0.13365	-0.09172	-0.01592	-0.06817	0.05725	0.06002	0.02179
HOW OFT INDIV INSTRT	0.3566	0.0295	0.0027	0.0398	0.7217	0.1268	0.1999	0.1790	0.6259
MACHINST	-0.03679	-0.09691	-0.09836	-0.09101	-0.04528	-0.03133	0.06418	0.05681	0.08449
HOW OFT MACH INSTRT	0.4104	0.0298	0.0274	0.0413	0.3108	0.4833	0.1507	0.2033	0.0583
TVLECTUR	-0.09067	-0.10410	-0.09488	-0.08090	-0.07364	-0.07090	-0.01363	0.00233	0.01591
HOW OFT TV LECTURE	0.0421	0.0195	0.0334	0.0698	0.0990	0.1122	0.7604	0.9584	0.7219
TEXTBKS	0.23622	0.13005	0.07854	0.06877	0.20151	0.10779	0.21542	0.18301	0.09171
HOW OFT USE TEXTBOOK	0.0001	0.0035	0.0784	0.1235	0.0001	0.0156	0.0001	0.0001	0.0398
LIBRARY	0.11381	0.04372	-0.01483	0.00362	0.11319	0.01741	0.12793	0.10952	0.01871
HOW OFT USE LIBRARY	0.0106	0.3278	0.7401	0.9354	0.0111	0.6970	0.0041	0.0140	0.6756

TABLE 10b
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 551 Females receiving Booklet 1)

Controlling for:	Mathematics Achievement						Math Courses Taken		
	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
RACE	0.42207	0.46327	0.48254	0.04559	0.01779	0.02959	0.09504	-0.01817	-0.01324
	0.0001	0.0001	0.0001	0.2854	0.6768	0.4882	0.0257	0.6704	0.7565
NONENGL	-0.13546	-0.17866	-0.18653	0.01178	-0.00149	-0.00184	0.00820	-0.02303	-0.02676
	0.0014	0.0001	0.0001	0.7826	0.9721	0.9657	0.8477	0.5895	0.5308
PARED	0.39257	0.22042	0.16623	-0.01661	-0.01225	-0.02851	0.36007	0.00665	-0.00521
PARENTS EDUCATION	0.0001	0.0001	0.0001	0.6972	0.7742	0.5042	0.0001	0.8762	0.9028
PARSES	0.32201	0.26887	0.20062	-0.01261	-0.02303	-0.03148	0.18166	-0.02985	-0.03842
	0.0001	0.0001	0.0001	0.7678	0.5896	0.4608	0.0001	0.4844	0.3680
COMMCHAR	0.47718	0.43334	0.42713	0.02731	0.02352	0.02164	0.22416	-0.00069	-0.00664
	0.0001	0.0001	0.0001	0.5223	0.5817	0.6123	0.0001	0.9871	0.8765
NSIBS	-0.16749	-0.12692	-0.11493	-0.01249	0.01597	0.01682	-0.11119	0.01633	0.01693
	0.0001	0.0028	0.0069	0.7698	0.7083	0.6936	0.0090	0.7021	0.6916
ACADORNT	0.58256	0.32115	0.02260	0.00205	0.48289	0.10275	0.54201	0.41962	0.05043
	0.0001	0.0001	0.5965	0.9617	0.0001	0.0158	0.0001	0.0001	0.2373
MOBILITY	-0.00660	-0.05190	-0.06220	-0.02700	0.01576	-0.02583	0.05616	0.04851	0.01498
	0.8772	0.2239	0.1448	0.5272	0.7120	0.5452	0.1881	0.2557	0.7257
AGEMONTH	0.01304	0.02573	0.01993	0.00485	0.01009	0.01505	-0.01181	-0.00222	0.00026
	0.7601	0.5466	0.6406	0.9096	0.8132	0.7244	0.7821	0.9584	0.9951
TVWATCHD	-0.22886	-0.16188	-0.12707	-0.05170	-0.10888	-0.05833	-0.16682	-0.08149	-0.02872
TV WATCHED LAST NITE	0.0001	0.0001	0.0028	0.2256	0.0105	0.1715	0.0001	0.0559	0.5012
PARTACTV	0.05943	-0.02060	-0.10798	-0.11078	0.00936	-0.13434	0.12417	0.06750	-0.05644
	0.1636	0.6295	0.0112	0.0093	0.8264	0.0016	0.0035	0.1135	0.1859
LOCUSCON	0.42974	0.25985	0.20838	0.13491	0.29871	0.16894	0.37021	0.26834	0.13894
	0.0001	0.0001	0.0001	0.0015	0.0001	0.0001	0.0001	0.0001	0.0011
SELFESTM	0.10309	-0.03901	-0.10098	-0.08543	0.08128	-0.09938	0.21963	0.17972	0.02692
	0.0155	0.3608	0.0177	0.0450	0.0566	0.0196	0.0001	0.0001	0.5283
MATHCONF	0.32818	0.20955	0.20253	0.26664	0.39366	0.28425	0.26837	0.29201	0.16870
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
MATHEFFT	0.28655	0.15518	0.06540	0.09314	0.28017	0.07679	0.27021	0.23451	0.03479
	0.0001	0.0003	0.1252	0.0288	0.0001	0.0717	0.0001	0.0001	0.4151

TABLE 10b
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 551 Females receiving Booklet 1)

Controlling for:	Mathematics Achievement						Math Courses Taken		
	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
MATHTKN	0.61812 0.0001	0.01158 0.7862	0.01100 0.7967	0.00251 0.9531	0.53093 0.0001	0.32737 0.0001	1.00000 0.0000	0.91776 0.0001	0.78307 0.0001
CALCUSE	0.10288 0.0157	0.11111 0.0090	0.10937 0.0102	0.05816 0.1728	0.05124 0.2298	0.01728 0.6857	0.02550 0.5503	0.00357 0.9334	-0.03623 0.3960
COMPUSE	0.13274 0.0018	0.03239 0.4480	0.03511 0.4108	0.00347 0.9351	0.08101 0.0574	0.03306 0.4387	0.17616 0.0001	0.13834 0.0011	0.10187 0.0168
CAIMUSE	0.03066 0.4726	-0.01071 0.8020	0.01068 0.8026	-0.02089 0.6246	0.01210 0.7769	0.01674 0.6950	0.06417 0.1325	0.07395 0.0829	0.08793 0.0391
INDMUSE	0.01040 0.8076	0.02071 0.6277	0.02191 0.6078	0.02635 0.5371	0.00917 0.8299	0.00359 0.9330	-0.00965 0.8211	-0.01712 0.6885	-0.02661 0.5331
MNIPUSE	0.03299 0.4396	0.00747 0.8612	0.01577 0.7119	-0.00914 0.8304	0.00959 0.8223	-0.00835 0.8450	0.04453 0.2967	0.04148 0.3311	0.02981 0.4850
MATHLUSE	0.01066 0.8029	-0.00231 0.9568	-0.01272 0.7658	0.00166 0.9690	0.02652 0.5344	0.00972 0.8199	0.02048 0.6314	0.02657 0.5336	0.01063 0.8033
STEXTUSE	0.00583 0.8915	0.06679 0.1173	0.05381 0.2073	0.03234 0.4487	0.01573 0.7126	0.02735 0.5217	-0.07665 0.0722	-0.04574 0.2838	-0.04501 0.2916
USEDCALC HAVE USED CALCULATOR	0.27907 0.0001	0.23711 0.0001	0.20204 0.0001	0.13673 0.0013	0.18428 0.0001	0.13063 0.0021	0.15216 0.0003	0.08979 0.0351	0.02234 0.6007
MATHFUNC STUDY FNS IN MATH	0.31382 0.0001	0.12832 0.0025	0.12791 0.0026	0.10645 0.0124	0.25869 0.0001	0.18349 0.0001	0.34965 0.0001	0.30856 0.0001	0.24307 0.0001
TAUTMETM TAUT METRIC SYS-MATH	0.04930 0.2480	0.05740 0.1785	0.05149 0.2275	0.04618 0.2792	0.03966 0.3528	0.02496 0.5587	0.00685 0.8726	0.00114 0.9786	-0.01919 0.6531
TAUTMET TAUGHT METRIC SYSTEM	0.22063 0.0001	0.09960 0.0194	0.06506 0.1272	0.05190 0.2239	0.16517 0.0001	0.07528 0.0775	0.23371 0.0001	0.17727 0.0001	0.09352 0.0282
MAYHSETS STUDY SETS IN MATH	0.27274 0.0001	0.20631 0.0001	0.17749 0.0001	0.08762 0.0398	0.16305 0.0001	0.11970 0.0049	0.18153 0.0001	0.13209 0.0019	0.08461 0.0471
LECTURE HOW OFTEN LECTURE	0.18759 0.0001	0.11099 0.0091	0.06747 0.1137	0.05824 0.1722	0.14827 0.0005	0.07419 0.0819	0.16474 0.0001	0.12134 0.0043	0.04626 0.2784
DISCUSS HOW OFTEN DISCUSS	0.09683 0.0416	0.02522 0.5547	-0.03827 0.3699	0.00579 0.8921	0.11514 0.0068	0.02580 0.5455	0.11002 0.0098	0.10804 0.0112	0.02249 0.5984

TABLE 10b
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 551 Females receiving Booklet 1)

Controlling for:	Mathematics Achievement						Math Courses Taken		
	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
PROJECT	0.21643	0.10217	0.04162	0.04311	0.19531	0.06581	0.22350	0.19692	0.07438
HOW OFT WK ON PROJCT	0.0001	0.0164	0.3295	0.3124	0.0001	0.1229	0.0001	0.0001	0.0811
WRITING	0.12053	-0.01308	-0.03504	-0.02766	0.09596	0.00463	0.21479	0.18182	0.10952
HOW OFTEN WRITE	0.0046	0.7594	0.4117	0.5170	0.0243	0.9136	0.0001	0.0001	0.0101
FLDTRIPS	-0.05858	-0.05689	-0.06038	0.01639	0.04359	0.03146	-0.02276	0.03823	0.02550
HOW OFTEN FLD TRIPS	0.1697	0.1824	0.1570	0.7011	0.3071	0.4611	0.5940	0.3704	0.5503
INDIVINS	0.03486	-0.00720	-0.03925	-0.04571	0.02534	-0.03097	0.06654	0.06414	0.01781
HOW OFT INDIV INSTRT	0.4141	0.8661	0.3577	0.2841	0.5529	0.4681	0.1187	0.1326	0.6766
MACHINST	0.00126	-0.02059	-0.02584	0.02165	0.04540	0.01111	0.02864	0.04319	0.01041
HOW OFT MACH INSTRT	0.9765	0.6297	0.5450	0.6121	0.2874	0.7948	0.5022	0.3116	0.8073
TVLECTUR	-0.09383	-0.08233	-0.07603	-0.02297	-0.03837	-0.03572	-0.04779	-0.02833	-0.02371
HOW OFT TV LECTURE	0.0276	0.0534	0.0746	0.5906	0.3607	0.4027	0.2627	0.5070	0.5787
TEXTBKS	0.24057	0.17268	0.11495	0.10771	0.19140	0.08892	0.17211	0.11634	0.00666
HOW OFT USE TEXTBOOK	0.0001	0.0001	0.0069	0.0114	0.0001	0.0369	0.0001	0.0063	0.8760
LIBRARY	0.06614	-0.01094	-0.04021	-0.02617	0.06990	-0.02038	0.12273	0.11931	0.04255
HOW OFT USE LIBRARY	0.1210	0.7977	0.3462	0.5399	0.1012	0.6331	0.0039	0.0050	0.3187

TABLE 10c

CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION

(Based on 110 Blacks receiving Booklet 1)

	Mathematics Achievement						Math Courses Taken		
Controlling for:	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
SEX	-0.17141	-0.21523	-0.30006	-0.06487	0.01941	-0.01342	0.04619	0.08480	0.05317
SEX	0.0734	0.0239	0.0014	0.5008	0.8405	0.8893	0.6318	0.3784	0.5812
NONENGL	-0.24319	-0.23518	-0.24810	-0.13402	-0.16938	-0.14004	-0.03806	-0.06977	-0.03207
	0.0105	0.0134	0.0090	0.1628	0.0769	0.1445	0.6930	0.4689	0.7395
PARED	0.37477	0.21501	0.19826	0.05899	-0.09976	-0.07542	0.27621	-0.17959	-0.14678
PARENTS EDUCATION	0.0001	0.0241	0.0379	0.5404	0.2998	0.4335	0.0035	0.0605	0.1260
PARSES	0.25696	0.27336	0.18504	0.04847	-0.12256	-0.11852	0.00351	-0.28714	-0.26630
	0.0067	0.0039	0.0530	0.6151	0.2021	0.2175	0.9710	0.0024	0.0049
COMMCHAR	0.33771	0.21776	0.16377	-0.15823	-0.16074	-0.17840	0.21346	-0.10731	-0.10831
	0.0003	0.0223	0.0873	0.0987	0.0934	0.0622	0.0252	0.2645	0.2600
NSIBS	-0.11403	0.00069	0.04177	0.06395	0.06252	0.07155	-0.18162	-0.00008	0.00354
	0.2356	0.9943	0.6648	0.5068	0.5165	0.4576	0.0576	0.9993	0.9708
ACADORNT	0.45015	0.35863	-0.03325	-0.05440	0.28713	-0.06305	0.18362	0.00935	-0.30288
	0.0001	0.0001	0.7302	0.5725	0.0024	0.5129	0.0548	0.9227	0.0013
MOBILITY	0.14777	0.13284	0.15056	0.07816	0.05583	0.01225	0.03798	-0.01038	-0.05012
	0.1234	0.1665	0.1164	0.4170	0.5624	0.8989	0.6937	0.9143	0.6031
AGEMONTH	-0.05976	-0.24562	-0.24108	-0.22955	-0.06716	-0.06420	0.26786	0.25037	0.24865
	0.5352	0.0097	0.0112	0.0158	0.4857	0.5052	0.0047	0.0083	0.0088
TVWATCHD	-0.09342	-0.07775	-0.10133	-0.08744	-0.08865	-0.09305	-0.03321	-0.04942	-0.04582
TV WATCHED LAST NITE	0.3317	0.4195	0.2922	0.3637	0.3571	0.3336	0.7306	0.6081	0.6345
PARTACTV	0.00736	-0.01685	-0.15275	-0.12622	-0.04966	-0.22376	0.03654	-0.03065	-0.17250
	0.9391	0.8613	0.1111	0.1889	0.6064	0.0188	0.7047	0.7506	0.0715
LOCUSCON	0.33060	0.22328	0.17954	0.16127	0.26994	0.15974	0.19406	0.12916	0.01526
	0.0004	0.0190	0.0605	0.0923	0.0043	0.0955	0.0422	0.1787	0.8743
SELFESTM	0.11694	0.05722	-0.02311	-0.06480	0.03766	-0.11258	0.10075	0.03851	-0.09119
	0.2237	0.5526	0.8106	0.5012	0.6961	0.2416	0.2950	0.6895	0.3434
MATHCONF	0.18173	0.14512	0.15791	0.21310	0.30022	0.23052	0.07362	0.16286	0.07987
	0.0574	0.1304	0.0994	0.0254	0.0014	0.0154	0.4447	0.0891	0.4069
MATHEFFT	0.15720	0.09982	-0.03535	0.06371	0.19697	-0.03591	0.10164	0.06634	-0.14372
	0.1010	0.2995	0.7139	0.5085	0.0392	0.7096	0.2907	0.4911	0.1342

TABLE 10c
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 110 Blacks receiving Booklet 1)

	Mathematics Achievement						Math Courses Taken		
Controlling for:	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
MATHTKN	0.41989 0.0001	-0.22698 0.0171	-0.11810 0.2191	-0.12612 0.1892	0.28465 0.0026	0.20870 0.0287	1.00000 0.0000	0.85980 0.0001	0.74899 0.0001
CALCUSE	0.10071 0.2952	0.17855 0.0620	0.15154 0.1140	0.06667 0.4889	-0.00540 0.9554	-0.00312 0.9742	-0.10403 0.2795	-0.16671 0.0817	-0.15882 0.0975
COMPUSE	0.26556 0.0050	0.15079 0.1159	0.15317 0.1101	0.09351 0.3312	0.19344 0.0429	0.11076 0.2494	0.19804 0.0381	0.14535 0.1298	0.05882 0.5416
CAIMUSE	0.26649 0.0049	0.10196 0.2892	0.08815 0.3598	0.08289 0.3893	0.25454 0.0073	0.15396 0.1083	0.27158 0.0041	0.25208 0.0079	0.14306 0.1360
INDMUSE	-0.02214 0.8184	0.09685 0.3142	0.05216 0.5884	0.03175 0.7419	0.03718 0.6997	-0.02435 0.8007	-0.17800 0.0628	-0.10015 0.2979	-0.15073 0.1160
MNIPUSE	0.10333 0.2827	0.05429 0.5732	0.08009 0.4056	0.04803 0.6183	0.05786 0.5483	0.02491 0.7962	0.08351 0.3857	0.05461 0.5710	0.02146 0.8239
MATHLUSE	0.12426 0.1959	0.11445 0.2338	0.07273 0.4502	0.08200 0.3944	0.17084 0.0743	0.12718 0.1855	0.02789 0.7724	0.06946 0.4709	0.01967 0.8384
STEXTUSE	-0.05967 0.5357	0.04904 0.6109	0.01126 0.9071	0.01523 0.8745	-0.01176 0.9029	-0.04019 0.6768	-0.16688 0.0814	-0.12050 0.2099	-0.13952 0.1460
USEDCALC HAVE USED CALCULATOR	0.04735 0.6233	-0.02007 0.8352	-0.05829 0.5453	-0.14670 0.1262	-0.12368 0.1980	-0.13225 0.1684	0.10461 0.2768	-0.01364 0.8875	-0.01253 0.8966
MATHFUNC STUDY FNS IN MATH	0.12283 0.2011	-0.08771 0.3622	-0.05626 0.5594	-0.10731 0.2645	-0.02910 0.7629	-0.05833 0.5449	0.32397 0.0006	0.20196 0.0344	0.17245 0.0716
TAUTMETM TAUT METRIC SYS-MATH	-0.02902 0.7634	0.03561 0.7119	0.00200 0.9834	0.01287 0.8938	-0.03603 0.7036	-0.06467 0.5021	-0.09852 0.3059	-0.11824 0.2186	-0.13598 0.1566
TAUTMET TAUGHT METRIC SYSTEM	0.06527 0.4981	-0.00945 0.9220	0.02464 0.7983	-0.00498 0.9588	-0.01457 0.8799	-0.01733 0.8574	0.11732 0.2222	0.05004 0.6036	0.04696 0.6262
MATHSETS STUDY SETS IN MATH	0.23265 0.0145	0.24153 0.0110	0.16632 0.0825	0.07698 0.4241	0.06164 0.5224	-0.01688 0.8611	0.01199 0.9011	-0.10884 0.2577	-0.17493 0.0676
LECTURE HOW OFTEN LECTURE	0.08480 0.3784	0.05654 0.5574	0.01578 0.8700	0.05777 0.5489	0.10102 0.2937	0.01139 0.9060	0.05085 0.5978	0.03953 0.6818	-0.04339 0.6527
DISCUSS HOW OFTEN DISCUSS	0.11148 0.2463	0.07106 0.4607	0.00269 0.9777	0.02661 0.7826	0.08336 0.3866	0.05483 0.5694	0.07169 0.4567	0.02809 0.7708	-0.00208 0.9828

TABLE 10c
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 110 Blacks receiving Booklet 1)

Controlling for:	Mathematics Achievement						Math Courses Taken		
	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
PROJECT	0.18595	0.14471	0.07225	0.07737	0.09659	0.00308	0.08092	-0.02494	-0.10866
HOW OFT WK ON PROJCT	0.0518	0.1315	0.4532	0.4217	0.3155	0.9746	0.4007	0.7959	0.2585
WRITING	0.09997	-0.04348	-0.07870	-0.03911	0.04344	0.01198	0.22249	0.13842	0.10460
HOW OFTEN WRITE	0.2988	0.6520	0.4138	0.6850	0.6523	0.9012	0.0195	0.1493	0.2768
FLDTRIPS	-0.16007	-0.16516	-0.11759	-0.06766	-0.04986	-0.03818	-0.00975	0.07793	0.08825
HOW OFTEN FLD TRIPS	0.0948	0.0847	0.2212	0.4825	0.6049	0.6921	0.9195	0.4184	0.3593
INDIVINS	0.03684	-0.03048	-0.05899	-0.06819	-0.03217	-0.04396	0.10333	0.03498	0.02594
HOW OFT INDIV INSTRT	0.7024	0.7519	0.5405	0.4791	0.7387	0.6484	0.2827	0.7168	0.7879
MACHINST	-0.07486	-0.01454	-0.08138	-0.05138	-0.05084	-0.11436	-0.09711	-0.09380	-0.14069
HOW OFT MACH INSTRT	0.4370	0.8802	0.3980	0.5940	0.5978	0.2342	0.3129	0.3297	0.1427
TVLECTUR	-0.13548	-0.11774	-0.17680	-0.11441	-0.08937	-0.12707	-0.04079	-0.03653	-0.06126
HOW OFT TV LECTURE	0.1582	0.2205	0.0647	0.2340	0.3531	0.1859	0.6722	0.7047	0.5250
TEXTBKS	0.15217	0.19373	0.10819	0.08582	0.08595	0.00423	-0.04494	-0.09606	-0.16680
HOW OFT USE TEXTBOOK	0.1125	0.0426	0.2606	0.3727	0.3720	0.9651	0.6411	0.3181	0.0816
LIBRARY	0.02386	0.04895	-0.06232	-0.12516	-0.08967	-0.16782	-0.03446	-0.11421	-0.17022
HOW OFT USE LIBRARY	0.8046	0.6115	0.5178	0.1926	0.3515	0.0797	0.7208	0.2348	0.0754

TABLE 10d
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 874 Whites receiving Booklet 1)

	Mathematics Achievement						Math Courses Taken		
Controlling for:	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
SEX	-0.08334	-0.12571	-0.17889	0.02066	0.01331	0.01646	0.01897	-0.00351	-0.00346
SEX	0.0137	0.0002	0.0001	0.5418	0.6943	0.6270	0.5754	0.9174	0.9187
NONENGL	-0.10326	-0.15847	-0.16425	-0.05556	-0.06160	-0.05768	0.02659	-0.02854	-0.01926
	0.0022	0.0001	0.0001	0.1007	0.0687	0.0883	0.4325	0.3993	0.5695
PARED	0.36343	0.16513	0.09061	0.00734	0.02998	0.02307	0.35279	0.03031	0.02394
PARENTS EDUCATION	0.0001	0.0001	0.0074	0.8285	0.3760	0.4958	0.0001	0.3708	0.4796
PARSES	0.24494	0.12527	0.05655	-0.00907	0.02041	0.02567	0.22189	0.05302	0.06346
	0.0001	0.0002	0.0948	0.7890	0.5467	0.4486	0.0001	0.1173	0.0607
COMMCHAR	0.27755	0.19156	0.18525	0.02748	0.02689	0.03706	0.19502	0.02017	0.02846
	0.0001	0.0001	0.0001	0.4171	0.4271	0.2737	0.0001	0.5515	0.4007
NSIBS	-0.06940	-0.01751	0.01570	-0.00554	-0.01128	-0.00463	-0.08331	-0.00810	-0.00138
	0.0402	0.6051	0.6430	0.8701	0.7392	0.8913	0.0137	0.8110	0.9674
ACADORNT	0.58610	0.25811	-0.06273	-0.00462	0.49556	0.13640	0.57827	0.47261	0.13515
	0.0001	0.0001	0.0638	0.8916	0.0001	0.0001	0.0001	0.0001	0.0001
MOBILITY	0.00672	-0.00698	0.00717	0.00023	0.00380	0.00469	0.01792	0.01718	0.02029
	0.8428	0.8368	0.8323	0.9946	0.9106	0.8899	0.5968	0.6120	0.5492
AGEMONTH	-0.04314	-0.03620	-0.04203	-0.01883	-0.00747	-0.01205	-0.02301	0.00248	-0.00008
	0.2026	0.2851	0.2145	0.5782	0.8255	0.7220	0.4968	0.9416	0.9981
TVWATCHD	-0.15156	-0.07117	-0.04003	-0.03548	-0.08816	-0.05762	-0.14451	-0.08153	-0.05203
TV WATCHED LAST NITE	0.0001	0.0354	0.2371	0.2948	0.0091	0.0887	0.0001	0.0159	0.1243
PARTACTV	0.06575	-0.01765	-0.09747	-0.06321	0.04703	-0.06638	0.11785	0.08314	-0.01602
	0.0520	0.6022	0.0039	0.0618	0.1648	0.0498	0.0005	0.0139	0.6363
LOCUSCON	0.41214	0.23914	0.16769	0.18783	0.35542	0.24823	0.34110	0.27412	0.16070
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
SELFESTM	0.14791	0.01192	-0.04770	-0.05309	0.10476	-0.07125	0.20644	0.17568	0.02433
	0.0001	0.7250	0.1588	0.1168	0.0019	0.0352	0.0001	0.0001	0.4726
MATHCONF	0.37124	0.24243	0.22071	0.25091	0.38202	0.27323	0.27652	0.27796	0.15916
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
MATHEFFT	0.32533	0.12083	0.00839	0.10129	0.32364	0.14538	0.34650	0.30166	0.13236
	0.0001	0.0003	0.8043	0.0027	0.0001	0.0001	0.0001	0.0001	0.0001

TABLE 10d
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 874 Whites receiving Booklet 1)

Controlling for:	Mathematics Achievement						Math Courses Taken		
	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
MATHTKN	0.64534 0.0001	-0.03536 0.2964	-0.04901 0.1477	0.00240 0.9436	0.55266 0.0001	0.35627 0.0001	1.00000 0.0000	0.93311 0.0001	0.81558 0.0001
CALCUSE	0.03461 0.3067	0.04713 0.1639	0.04724 0.1629	0.04104 0.2255	0.02914 0.3896	0.02930 0.3869	-0.00210 0.9505	-0.00722 0.8311	-0.01327 0.6952
COMPUSE	0.06222 0.0660	-0.00431 0.8988	-0.00389 0.9086	-0.00030 0.9929	0.02750 0.4168	0.01045 0.7577	0.09744 0.0039	0.05936 0.0795	0.04896 0.1481
CAIMUSE	0.00134 0.9685	-0.02690 0.4270	-0.01129 0.7390	-0.02245 0.5074	-0.02446 0.4702	0.00548 0.8715	0.03257 0.3361	0.01503 0.6573	0.04956 0.1432
INDMUSE	0.01492 0.6596	0.00825 0.8077	0.02204 0.5152	0.02274 0.5020	0.00166 0.9610	0.02007 0.5535	0.01281 0.7052	-0.00391 0.9081	0.01224 0.7178
MNIPUSE	0.02756 0.4157	0.01929 0.5690	0.01527 0.6521	0.01926 0.5697	0.02644 0.4350	0.01548 0.6476	0.01907 0.5735	0.01985 0.5577	0.00855 0.8007
MATHLUSE	0.02361 0.4858	0.00401 0.9058	-0.00898 0.7910	-0.02314 0.4945	-0.00395 0.9071	-0.00256 0.9397	0.03056 0.3669	0.01140 0.7364	0.01531 0.6512
STEXTUSE	-0.00867 0.7979	0.04109 0.2249	0.03929 0.2459	0.04794 0.1567	0.02906 0.3909	0.04683 0.1666	-0.05962 0.0782	-0.02407 0.4773	-0.01662 0.6236
USEDCALC HAVE USED CALCULATOR	0.23716 0.0001	0.19418 0.0001	0.16453 0.0001	0.16046 0.0001	0.20065 0.0001	0.15663 0.0001	0.13197 0.0001	0.09596 0.0045	0.03721 0.2718
MATHFUNC STUDY FNS IN MATH	0.32646 0.0001	0.13281 0.0001	0.11915 0.0004	0.11400 0.0007	0.28027 0.0001	0.21667 0.0001	0.33455 0.0001	0.30605 0.0001	0.25137 0.0001
TAUTMETM TAUT METRIC SYS-MATH	0.00320 0.9246	0.02676 0.4294	0.01593 0.6382	0.00492 0.8845	0.00263 0.9381	-0.00283 0.9333	-0.02566 0.4487	-0.02135 0.5284	-0.03051 0.3676
TAUTMET TAUGHT METRIC SYSTEM	0.22523 0.0001	0.07924 0.0191	0.03500 0.3013	0.02085 0.5382	0.16161 0.0001	0.07340 0.0300	0.24491 0.0001	0.19664 0.0001	0.12069 0.0003
MATHSETS STUDY SETS IN MATH	0.27670 0.0001	0.14996 0.0001	0.12441 0.0002	0.12980 0.0001	0.24825 0.0001	0.21634 0.0001	0.24105 0.0001	0.22569 0.0001	0.19219 0.0001
LECTURE HOW OFTEN LECTURE	0.18304 0.0001	0.07230 0.0326	0.02019 0.5511	0.04224 0.2122	0.15314 0.0001	0.10542 0.0018	0.19003 0.0001	0.15248 0.0001	0.10804 0.0014
DISCUSS HOW OFTEN DISCUSS	0.12415 0.0002	0.03787 0.2634	-0.00918 0.7864	0.02050 0.5451	0.12808 0.0001	0.03642 0.2821	0.14159 0.0001	0.13564 0.0001	0.05181 0.1259

TABLE 10d
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 874 Whites receiving Booklet 1)

Controlling for:	Mathematics Achievement						Math Courses Taken		
	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
PROJECT	0.24907	0.11037	0.07004	0.08108	0.22189	0.13678	0.24497	0.22199	0.14295
HOW OFT WK ON PROJCT	0.0001	0.0011	0.0384	0.0165	0.0001	0.0001	0.0001	0.0001	0.0001
WRITING	0.13535	0.01301	-0.01471	0.02250	0.12522	0.03862	0.18651	0.15912	0.08448
HOW OFTEN WRITE	0.0001	0.7009	0.6641	0.5064	0.0002	0.2541	0.0001	0.0001	0.0125
FLDTRIPS	-0.01696	-0.02153	-0.02580	-0.02275	0.00162	-0.00561	-0.00074	0.02421	0.02135
HOW OFTEN FLD TRIPS	0.6167	0.5250	0.4461	0.5018	0.9618	0.8684	0.9825	0.4747	0.5285
INDIVINS	-0.00278	-0.05909	-0.10115	-0.07065	0.00779	-0.04456	0.06304	0.06536	0.02657
HOW OFT INDIV INSTRT	0.9346	0.0808	0.0028	0.0368	0.8182	0.1882	0.0625	0.0534	0.4327
MACHINST	0.03323	-0.03387	-0.02995	-0.01569	0.03019	0.02875	0.08792	0.08376	0.09156
HOW OFT MACH INSTRT	0.3265	0.3173	0.3765	0.6431	0.3727	0.3960	0.0093	0.0132	0.0068
TVLECTUR	-0.08775	-0.07815	-0.05935	-0.06076	-0.07850	-0.07027	-0.04167	-0.03020	-0.01431
HOW OFT TV LECTURE	0.0094	0.0209	0.0795	0.0726	0.0203	0.0378	0.2185	0.3725	0.6726
TEXTBKS	0.22612	0.11976	0.05936	0.08632	0.19858	0.10092	0.20015	0.16264	0.06581
HOW OFT USE TEXTBOOK	0.0001	0.0004	0.0794	0.0107	0.0001	0.0028	0.0001	0.0001	0.0518
LIBRARY	0.11578	0.01650	-0.02227	-0.00524	0.10463	0.01247	0.15344	0.14481	0.06607
HOW OFT USE LIBRARY	0.0006	0.6262	0.5108	0.8772	0.0020	0.7129	0.0001	0.0001	0.0509

TABLE 11 PARTIAL CORRELATION OF MATH ACHIEVEMENT WITH SEX AND RACE AFTER CONTROLLING FOR DIFFERENT INTERVENING MEASURES
(Based on 1054 Booklet 1 Examinees)

Variable Controlled	Correlation with: Sex	Race
Math Taken	-0.1232 0.0001	0.4242 0.0001
Academic Aptitude	-0.1358 0.0001	0.4476 0.0001
Math Effort	-0.1608 0.0001	0.4213 0.0001
Math Confidence	-0.0593 0.0541	0.4257 0.0001
Locus of Control	-0.1139 0.0002	0.3580 0.0001
Self Esteem	-0.0734 0.0172	0.4062 0.0001
Extra Activity	-0.1097 0.0004	0.3990 0.0001
Parent's Education	-0.0960 0.0018	0.3361 0.0001
Parent's SES	-0.0922 0.0027	0.3424 0.0001
No. of Siblings	-0.0846 0.0060	0.3615 0.0001
None	-0.0865 0.0001	0.3965 0.0001

Note: Entries are partial correlations of Sex or Race with Math Achievement controlling for the indicated variables, followed by the significance level of the correlation. High values for sex indicate female; high values for race indicate White.

TABLE 12
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 5324 Booklet 2 examinees)

Controlling for:	Mathematics Achievement						Math Courses Taken			Acad. Ornt.
	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd	-
RACE	0.40736	0.40291	0.42915	-	-	-	0.14107	-	-	0.06027
	0.0001	0.0001	0.0001				0.0001			0.0001
SEX	-0.09802	-0.11049	-0.14315	-	-	-	-0.01579	-	-	0.06257
SEX	0.0001	0.0001	0.0001				0.2495			0.0001
NONENGL	-0.10984	-0.11847	-0.13478	-	-	-	-0.02484	-	-	0.01375
	0.0001	0.0001	0.0001				0.0699			0.3158
PARED	0.37337	0.22849	0.18348	-	-	-	0.31822	-	-	0.31919
PARENTS EDUCATION	0.0001	0.0001	0.0001				0.0001			0.0001
PARSES	0.37755	0.27313	0.22638	-	-	-	0.26532	-	-	0.30127
	0.0001	0.0001	0.0001				0.0001			0.0001
COMMCHAR	0.34174	0.29886	0.32455	-	-	-	0.17087	-	-	0.06394
	0.0001	0.0001	0.0001				0.0001			0.0001
NSIBS	-0.20751	-0.15998	-0.14209	-	-	-	-0.13260	-	-	-0.13932
	0.0001	0.0001	0.0001				0.0001			0.0001
ACADORNT	0.52804	0.25825	-	-	0.45862	-	0.53711	0.43414	-	0
	0.0001	0.0001			0.0001		0.0001	0.0001		0.0000
MOBILITY	-0.09448	-0.06864	-0.07911	-0.02686	-0.02228	-0.04099	-0.06600	-0.02355	-0.04094	-0.01707
	0.0001	0.0001	0.0001	0.0500	0.1041	0.0028	0.0001	0.0858	0.0028	0.2130
AGEMONTH	0.02309	0.00245	-0.00314	0.00718	0.03711	0.01776	0.03536	0.04520	0.02795	0.03398
	0.0920	0.8583	0.8186	0.6002	0.0068	0.1951	0.0099	0.0010	0.0414	0.0132
TVWATCHD	-0.18541	-0.11944	-0.10946	-0.04958	-0.10634	-0.07358	-0.15001	-0.10233	-0.07036	-0.12253
TV WATCHED LAST NITE	0.0001	0.0001	0.0001	0.0003	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
PARTACTV	0.07972	-0.00534	-0.08187	-0.06060	0.07504	-0.05477	0.14056	0.11762	0.00193	0.27551
	0.0001	0.6967	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.8880	0.0001
LOCUSCON	0.39775	0.26455	0.18827	0.16028	0.32183	0.18087	0.31062	0.23121	0.08494	0.40191
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
SELFESTM	0.10457	0.03048	-0.01548	0.02293	0.11884	0.03748	0.13409	0.11805	0.04118	0.19660
	0.0001	0.0261	0.2588	0.0943	0.0001	0.0062	0.0001	0.0001	0.0027	0.0001
MATHCONF	0.31979	0.19493	0.15252	0.20494	0.35687	0.25004	0.27359	0.26988	0.15554	0.28397
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

TABLE 12
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 5324 Booklet 2 examinees)

	Mathematics Achievement						Math Courses Taken			Acad. Ornt.
Controlling for:	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd	-
MATHEFFT	0.22539 0.0001	0.06951 0.0001	-0.02640 0.0541	0.03832 0.0052	0.24937 0.0001	0.07375 0.0001	0.28390 0.0001	0.26071 0.0001	0.09662 0.0001	0.41324 0.0001
MATHTKN	0.59761 0.0001	-	-	-	0.50446 0.0001	0.32782 0.0001	1.0 0.0000	0.93106 0.0001	0.82001 0.0001	0.53711 0.0001
CALCUSE	0.00853 0.5337	0.01233 0.3683	0.02580 0.0598	-0.02777 0.0427	-0.04689 0.0006	-0.02760 0.0440	-0.00227 0.8685	-0.02649 0.0532	-0.00536 0.6956	-0.03491 0.0109
COMPUSE	0.02383 0.0821	-0.02300 0.0934	-0.01624 0.2361	-0.02513 0.0667	-0.00879 0.5214	-0.00121 0.9295	0.07073 0.0001	0.04075 0.0029	0.05459 0.0001	0.01723 0.2068
CAIMUSE	0.04011 0.0034	0.00244 0.8585	0.01533 0.2634	-0.01108 0.4189	-0.00239 0.8618	0.01189 0.3856	0.06385 0.0001	0.03657 0.0076	0.05515 0.0001	0.00082 0.9523
INDMUSE	-0.00373 0.7853	-0.01146 0.4032	-0.01075 0.4329	0.01954 0.1539	0.01577 0.2501	0.02472 0.0713	0.00913 0.5055	0.00966 0.4810	0.01703 0.2142	0.00152 0.9115
MNIPUSE	-0.00830 0.5449	-0.00201 0.8837	-0.00385 0.7790	0.00760 0.5791	0.00382 0.7807	0.00405 0.7679	-0.01120 0.4140	-0.00615 0.6539	-0.00732 0.5936	-0.00145 0.9157
MATHLUSE	0.01489 0.2774	-0.02528 0.0651	-0.02198 0.1087	-0.00185 0.8924	0.02163 0.1146	0.02105 0.1247	0.05883 0.0001	0.05333 0.0001	0.05690 0.0001	0.01961 0.1525
STEXTUSE	0.02033 0.1381	0.02311 0.0918	0.01121 0.4134	0.02091 0.1272	0.03714 0.0067	0.01633 0.2334	0.00301 0.8261	0.01554 0.2570	-0.00708 0.6055	0.03587 0.0089
USEDCALC HAVE USED CALCULATOR	0.22406 0.0001	0.16636 0.0001	0.14548 0.0001	0.07521 0.0001	0.12799 0.0001	0.08779 0.0001	0.15173 0.0001	0.08872 0.0001	0.04487 0.0011	0.15827 0.0001
MATHFUNC STUDY FNS IN MATH	0.29051 0.0001	0.15797 0.0001	0.13382 0.0001	0.10618 0.0001	0.23574 0.0001	0.16055 0.0001	0.27418 0.0001	0.23085 0.0001	0.15816 0.0001	0.23151 0.0001
TAUTMETM TAUT METRIC SYS-MATH	-0.00411 0.7644	0.01187 0.3864	0.01340 0.3283	0.02302 0.0930	0.00750 0.5845	0.01370 0.3175	-0.02280 0.0962	-0.02044 0.1359	-0.01851 0.1768	-0.01468 0.2843
TAUTMET TAUGHT METRIC SYSTEM	0.18257 0.0001	0.08116 0.0001	0.05998 0.0001	0.06023 0.0001	0.16098 0.0001	0.09999 0.0001	0.19660 0.0001	0.16909 0.0001	0.11202 0.0001	0.17189 0.0001
MATHSETS STUDY SETS IN MATH	0.24882 0.0001	0.14760 0.0001	0.12876 0.0001	0.10221 0.0001	0.19716 0.0001	0.14308 0.0001	0.21833 0.0001	0.17819 0.0001	0.12357 0.0001	0.18622 0.0001

TABLE 12
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 5324 Booklet 2 examinees)

Controlling for:	Mathematics Achievement						Math Courses Taken			Acad. Ornt.
	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd	-
LECTURE	0.23224	0.15385	0.11120	0.07973	0.16416	0.09098	0.18220	0.12025	0.04476	0.23006
HOW OFTEN LECTURE	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0011	0.0001
DISCUSS	0.08790	0.03719	-0.00253	0.01347	0.08060	0.01898	0.09719	0.07535	0.01659	0.16130
HOW OFTEN DISCUSS	0.0001	0.0067	0.8533	0.3258	0.0001	0.1661	0.0001	0.0001	0.2261	0.0001
PROJECT	0.22430	0.11124	0.07564	0.04410	0.15849	0.07932	0.22609	0.17071	0.09729	0.22953
HOW OFT WK ON PROJCT	0.0001	0.0001	0.0001	0.0013	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
WRITING	0.13007	0.03529	-0.00277	0.00049	0.09928	0.02909	0.17031	0.13323	0.07163	0.19595
HOW OFTEN WRITE	0.0001	0.0100	0.8401	0.9713	0.0001	0.0338	0.0001	0.0001	0.0001	0.0001
FLDTRIPS	-0.10191	-0.09216	-0.10213	-0.06994	-0.06397	-0.07550	-0.04689	-0.02379	-0.02852	-0.01122
HOW OFTEN FLD TRIPS	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0006	0.0827	0.0375	0.4129
INDIVINS	0.00194	-0.02357	-0.03985	-0.02259	0.00837	-0.01757	0.03487	0.02923	0.00785	0.05830
HOW OFT INDIV INSTRT	0.8877	0.0654	0.0036	0.0993	0.5417	0.1999	0.0110	0.0329	0.5670	0.0001
MACHINST	-0.01916	-0.03415	-0.03525	-0.02675	-0.02593	-0.01989	0.01375	0.00196	0.01159	0.00574
HOW OFT MACH INSTRT	0.1621	0.0127	0.0101	0.0510	0.0585	0.1468	0.3159	0.8864	0.3980	0.6752
TVLECTUR	-0.11222	-0.10900	-0.11007	-0.08897	-0.08729	-0.08842	-0.04154	-0.02530	-0.01720	-0.03393
HOW OFT TV LECTURE	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0024	0.0649	0.2096	0.0133
TEXTBKS	0.24184	0.15096	0.11159	0.11339	0.21015	0.13737	0.20213	0.16001	0.08365	0.23181
HOW OFT USE TEXTBOOK	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
LIBRARY	0.07556	0.00888	-0.02777	-0.01805	0.06256	-0.00366	0.11452	0.09059	0.03221	0.15883
HOW OFT USE LIBRARY	0.0001	0.5170	0.0427	0.1880	0.0001	0.7892	0.0001	0.0001	0.0187	0.0001

TABLE 13a
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 2608 Males receiving Booklet 2)

	Mathematics Achievement						Math Courses Taken		
Controlling for:	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
RACE	0.41327	0.40503	0.43656	0.01929	0.01878	0.02751	0.14866	0.01683	0.02478
	0.0001	0.0001	0.0001	0.3248	0.3378	0.1602	0.0001	0.3903	0.2059
NONENGL	-0.10478	-0.12246	-0.13823	0.01945	0.02642	0.02555	-0.01161	0.02098	0.01949
	0.0001	0.0001	0.0001	0.3208	0.1774	0.1921	0.5535	0.2842	0.3196
PARED	0.34997	0.21245	0.17615	-0.00387	-0.01350	-0.00107	0.29811	-0.00639	0.00617
PARENTS EDUCATION	0.0001	0.0001	0.0001	0.8436	0.4908	0.9563	0.0001	0.7443	0.7528
PARSES	0.36918	0.27373	0.23330	0.01647	0.00919	0.01855	0.24901	0.00114	0.00876
	0.0001	0.0001	0.0001	0.4004	0.6390	0.3437	0.0001	0.9534	0.6547
COMMCHAR	0.35736	0.30430	0.32731	0.02328	0.04049	0.03034	0.18915	0.03309	0.02273
	0.0001	0.0001	0.0001	0.2347	0.0387	0.1214	0.0001	0.0911	0.2460
NSIBS	-0.22213	-0.16508	-0.14435	-0.01360	-0.02791	-0.01939	-0.14932	-0.02562	-0.01746
	0.0001	0.0001	0.0001	0.4876	0.1542	0.3223	0.0001	0.1909	0.3727
ACADORNT	0.52259	0.24333	-0.00811	-0.00951	0.45876	0.00179	0.54266	0.45184	0.02629
	0.0001	0.0001	0.6789	0.6275	0.0001	0.9272	0.0001	0.0001	0.1796
MOBILITY	-0.11433	-0.08126	-0.09715	-0.02867	-0.02476	-0.04855	-0.08174	-0.03262	-0.05606
	0.0001	0.0001	0.0001	0.1433	0.2062	0.0132	0.0001	0.0958	0.0042
AGEMONTH	0.03255	0.01424	0.01079	0.02127	0.04283	0.02974	0.03501	0.03849	0.02582
	0.0965	0.4674	0.5819	0.2775	0.0287	0.1289	0.0738	0.0494	0.1874
TVWATCHD	-0.15504	-0.09187	-0.08395	-0.02774	-0.08531	-0.05252	-0.13503	-0.09674	-0.06814
TV WATCHED LAST NITE	0.0001	0.0001	0.0001	0.1567	0.0001	0.0073	0.0001	0.0001	0.0005
PARTACTV	0.03371	-0.03381	-0.09914	-0.08878	0.02835	-0.08630	0.10033	0.08571	-0.01292
	0.0852	0.0842	0.0001	0.0001	0.1478	0.0001	0.0001	0.0001	0.5096
LOCUSCON	0.40680	0.27573	0.21189	0.17129	0.32906	0.19840	0.30854	0.23853	0.10497
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
SELFESTM	0.12834	0.06169	0.00984	0.03606	0.12557	0.04230	0.13071	0.10375	0.02343
	0.0001	0.0016	0.6155	0.0656	0.0001	0.0308	0.0001	0.0001	0.2317
MATHCONF	0.35178	0.20885	0.15312	0.20810	0.37781	0.25374	0.30586	0.28667	0.15937
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
MATHEFFT	0.24301	0.06923	-0.02513	0.00524	0.23895	0.04932	0.31028	0.28156	0.11171
	0.0001	0.0004	0.1995	0.7891	0.0001	0.0118	0.0001	0.0001	0.0001

TABLE 13a
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 2608 Males receiving Booklet 2)

Controlling for:	Mathematics Achievement						Math Courses Taken		
	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
MATHTKN	0.60229	-0.00348	0.00014	0.00469	0.51557	0.33644	1.00000	0.93760	0.83335
	0.0001	0.8592	0.9942	0.8109	0.0001	0.0001	0.0000	0.0001	0.0001
CALCUSE	0.00253	0.00295	0.03050	-0.02192	-0.04884	-0.01132	0.00030	-0.01745	0.02188
	0.8970	0.8805	0.1194	0.2631	0.0126	0.5635	0.9877	0.3731	0.2639
COMPUSE	0.02823	-0.02220	-0.01351	-0.02269	-0.00724	0.00341	0.07596	0.04339	0.06058
	0.1495	0.2570	0.4904	0.2468	0.7119	0.8618	0.0001	0.0267	0.0020
CAIMUSE	0.02691	-0.00555	0.01057	-0.02060	-0.01403	0.00140	0.05180	0.03005	0.05073
	0.1694	0.7770	0.5895	0.2931	0.4739	0.9432	0.0081	0.1249	0.0096
INDMUSE	0.00426	0.00133	0.00136	0.02645	0.02439	0.02990	0.00529	0.01103	0.01435
	0.8279	0.9461	0.9447	0.1769	0.2130	0.1269	0.7871	0.5735	0.4639
MNIPUSE	-0.01922	0.01218	0.01187	0.02432	-0.00015	0.00831	-0.04783	-0.03746	-0.03493
	0.3265	0.5342	0.5446	0.2144	0.9937	0.6715	0.0146	0.0558	0.0745
MATHLUSE	0.04303	-0.01056	-0.00823	-0.00698	0.02748	0.02177	0.08504	0.06975	0.07062
	0.0280	0.5898	0.6743	0.7216	0.1607	0.2665	0.0001	0.0004	0.0003
STEXTUSE	0.02373	0.02592	0.01636	0.03567	0.04941	0.03323	0.00502	0.02060	0.00157
	0.2258	0.1857	0.4035	0.0685	0.0116	0.0897	0.7979	0.2930	0.9361
USEDCALC	0.20499	0.13588	0.11924	0.04152	0.09725	0.06147	0.15952	0.09265	0.05901
HAVE USED CALCULATOR	0.0001	0.0001	0.0001	0.0340	0.0001	0.0017	0.0001	0.0001	0.0026
MATHFUNC	0.31220	0.18387	0.15709	0.13003	0.25933	0.18067	0.27339	0.23142	0.15510
STUDY FNS IN MATH	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
TAUTMETM	0.00076	0.01552	0.01441	0.01945	0.00251	0.00861	-0.01922	-0.02479	-0.02301
TAUT METRIC SYS-MATH	0.9692	0.4282	0.4621	0.3207	0.8982	0.6603	0.3264	0.2057	0.2402
TAUTMET	0.22655	0.11528	0.09677	0.09428	0.19937	0.13986	0.22234	0.19062	0.13467
TAUGHT METRIC SYSTEM	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
MATHSETS	0.29414	0.18519	0.16407	0.12833	0.22533	0.16885	0.24180	0.18665	0.12934
STUDY SETS IN MATH	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
LECTURE	0.23555	0.15566	0.11471	0.08569	0.17459	0.09984	0.18393	0.12947	0.05396
HOW OFTEN LECTURE	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0058
DISCUSS	0.07624	0.02393	-0.00898	-0.00439	0.06535	0.00640	0.09443	0.07890	0.02611
HOW OFTEN DISCUSS	0.0001	0.2219	0.6467	0.8228	0.0008	0.7440	0.0001	0.0001	0.1825

TABLE 13a
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 2608 Males receiving Booklet 2)

	Mathematics Achievement						Math Courses Taken		
Controlling for:	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
PROJECT	0.23837	0.13786	0.11161	0.08173	0.17758	0.11527	0.21208	0.16148	0.10178
HOW OFT WK ON PROJCT	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
WRITING	0.15536	0.06241	0.02407	0.01625	0.11823	0.04211	0.17442	0.13631	0.06838
HOW OFTEN WRITE	0.0001	0.0014	0.2192	0.4068	0.0001	0.0315	0.0001	0.0001	0.0005
FLDTRIPS	-0.12559	-0.10250	-0.12458	-0.09460	-0.08677	-0.11394	-0.07232	-0.04866	-0.06891
HOW OFTEN FLD TRIPS	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0129	0.0004
INDIVINS	-0.01592	-0.03704	-0.05027	-0.04491	-0.01994	-0.04078	0.02256	0.01517	0.00068
HOW OFT INDIV INSTRT	0.4164	0.0586	0.0102	0.0218	0.3088	0.0373	0.2494	0.4386	0.9721
MACHINST	-0.02729	-0.04869	-0.05053	-0.04526	-0.03480	-0.03598	0.01914	0.00853	0.01352
HOW OFT MACH INSTRT	0.1635	0.0129	0.0099	0.0208	0.0756	0.0662	0.3286	0.6631	0.4899
TVLECTUR	-0.13390	-0.11971	-0.11518	-0.09827	-0.10884	-0.10048	-0.06336	-0.04348	-0.02673
HOW OFT TV LECTURE	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0012	0.0264	0.1723
TEXTBKS	0.25059	0.14331	0.10102	0.08733	0.19962	0.11702	0.22509	0.17333	0.09331
HOW OFT USE TEXTBOOK	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
LIBRARY	0.09620	0.03860	-0.00077	-0.00113	0.07445	0.00530	0.10806	0.07940	0.01589
HOW OFT USE LIBRARY	0.0001	0.0487	0.9687	0.9540	0.0001	0.7868	0.0001	0.0001	0.4173

TABLE 13b
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 2716 Females receiving Booklet 2)

	Mathematics Achievement						Math Courses Taken		
Controlling for:	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
RACE	0.40613	0.40651	0.43177	-0.01941	-0.01882	-0.02785	0.13363	-0.01719	-0.02493
	0.0001	0.0001	0.0001	0.3118	0.3267	0.1468	0.0001	0.3704	0.1940
NONENGL	-0.12677	-0.12710	-0.14881	-0.02178	-0.02946	-0.02877	-0.04143	-0.02384	-0.02182
	0.0001	0.0001	0.0001	0.2566	0.1248	0.1339	0.0308	0.2142	0.2557
PARED	0.40374	0.25091	0.19970	0.00386	0.01344	0.00108	0.33948	0.00649	-0.00617
PARENTS EDUCATION	0.0001	0.0001	0.0001	0.8405	0.4838	0.9551	0.0001	0.7355	0.7481
PARSES	0.38509	0.27088	0.21771	-0.01580	-0.00878	-0.01790	0.28125	-0.00112	-0.00840
	0.0001	0.0001	0.0001	0.4104	0.6473	0.3511	0.0001	0.9537	0.6616
COMMCHAR	0.32817	0.29564	0.32669	-0.02347	-0.04066	-0.03076	0.15226	-0.03387	-0.02290
	0.0001	0.0001	0.0001	0.2214	0.0341	0.1090	0.0001	0.0776	0.2328
NSIBS	-0.19167	-0.15336	-0.13823	0.01391	0.02843	0.01995	-0.11499	0.02661	0.01786
	0.0001	0.0001	0.0001	0.4687	0.1385	0.2987	0.0001	0.1657	0.3522
ACADORNT	0.55325	0.29126	0.02647	0.00960	0.46050	-0.00182	0.53611	0.41816	-0.02653
	0.0001	0.0001	0.1678	0.6172	0.0001	0.9246	0.0001	0.0001	0.1669
MOBILITY	-0.07704	-0.05890	-0.06505	-0.02499	-0.01971	-0.03310	-0.04991	-0.01400	-0.02526
	0.0001	0.0021	0.0007	0.1929	0.3046	0.0846	0.0093	0.4659	0.1882
AGEMONTH	0.01447	-0.00859	-0.01641	-0.00755	0.03116	0.00516	0.03589	0.05233	0.03018
	0.4510	0.6545	0.3925	0.6942	0.1045	0.7879	0.0615	0.0064	0.1158
TVWATCHD	-0.22187	-0.15310	-0.14405	-0.07136	-0.12731	-0.09475	-0.16604	-0.10818	-0.07267
TV WATCHED LAST NITE	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002
PARTACTV	0.13957	0.03838	-0.04510	-0.03478	0.11937	-0.02561	0.18258	0.14929	0.01587
	0.0001	0.0455	0.0187	0.0699	0.0001	0.1821	0.0001	0.0001	0.4085
LOCUSCON	0.41419	0.27939	0.19629	0.15003	0.31700	0.16380	0.31862	0.22540	0.06450
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0008
SELFESTM	0.07016	-0.01364	-0.06013	0.01043	0.11317	0.03307	0.13620	0.13294	0.05857
	0.0003	0.4775	0.0017	0.5870	0.0001	0.0848	0.0001	0.0001	0.0023
MATHCONF	0.28497	0.17451	0.14182	0.20312	0.33913	0.24802	0.24311	0.25559	0.15281
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
MATHEFFT	0.27688	0.13479	0.04774	0.07686	0.27766	0.10549	0.28311	0.25566	0.08685
	0.0001	0.0001	0.0128	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

TABLE 13b
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 2716 Females receiving Booklet 2)

	Mathematics Achievement						Math Courses Taken		
Controlling for:	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
MATHTKN	0.59560	0.00005	-0.00488	-0.00499	0.49281	0.31866	1.00000	0.92423	0.80603
	0.0001	0.9979	0.7994	0.7948	0.0001	0.0001	0.0000	0.0001	0.0001
CALCUSE	0.01831	0.02586	0.02772	-0.03347	-0.04515	-0.04343	-0.00413	-0.03541	-0.03156
	0.3401	0.1779	0.1486	0.0812	0.0186	0.0236	0.8298	0.0650	0.1000
COMPUSE	0.01915	-0.02452	-0.01999	-0.02768	-0.01040	-0.00605	0.06523	0.03798	0.04837
	0.3184	0.2014	0.2976	0.1493	0.5880	0.7528	0.0007	0.0478	0.0117
CAIMUSE	0.05332	0.00993	0.01979	-0.00142	0.00940	0.02263	0.07615	0.04332	0.05967
	0.0054	0.6051	0.3025	0.9412	0.6245	0.2385	0.0001	0.0240	0.0019
INDMUSE	-0.00792	-0.01991	-0.01756	0.01275	0.00730	0.01962	0.01355	0.00831	0.01969
	0.6798	0.2996	0.3604	0.5066	0.7036	0.3067	0.4801	0.6652	0.3049
MNIPUSE	0.00967	-0.00871	-0.01004	-0.00964	0.00790	-0.00037	0.02798	0.02666	0.02117
	0.6146	0.6501	0.6010	0.6155	0.6805	0.9844	0.1449	0.1649	0.2701
MATHLUSE	-0.01812	-0.04540	-0.04302	0.00346	0.01559	0.02031	0.03081	0.03609	0.04270
	0.3452	0.0180	0.0250	0.8568	0.4166	0.2901	0.1094	0.0601	0.0261
STEXTUSE	0.01665	0.02008	0.00554	0.00579	0.02464	-0.00107	0.00088	0.01028	-0.01594
	0.3857	0.2955	0.7731	0.7630	0.1993	0.9555	0.9635	0.5922	0.4063
USEDCALC	0.24291	0.19575	0.17146	0.11069	0.15848	0.11416	0.14385	0.08492	0.03091
HAVE USED CALCULATOR	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.1073
MATHFUNC	0.27242	0.13497	0.11420	0.08205	0.21199	0.14013	0.27536	0.23047	0.16133
STUDY FNS IN MATH	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
TAUTMETM	-0.01408	0.00271	0.00522	0.02667	0.01255	0.01892	-0.02731	-0.01599	-0.01398
TAUT METRIC SYS-MATH	0.4631	0.8875	0.7857	0.1646	0.5133	0.3244	0.1548	0.4047	0.4665
TAUTMET	0.13547	0.04197	0.01545	0.02716	0.12406	0.06115	0.17087	0.14833	0.09022
TAUGHT METRIC SYSTEM	0.0001	0.0287	0.4210	0.1571	0.0001	0.0014	0.0001	0.0001	0.0001
MATHSETS	0.20851	0.11649	0.10319	0.07213	0.16527	0.11338	0.19300	0.16081	0.11736
STUDY SETS IN MATH	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001
LECTURE	0.24136	0.16517	0.12451	0.07377	0.15393	0.08200	0.18249	0.11090	0.03535
HOW OFTEN LECTURE	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0655
DISCUSS	0.11790	0.07001	0.02882	0.03145	0.09645	0.03181	0.10354	0.07240	0.00720
HOW OFTEN DISCUSS	0.0001	0.0003	0.1332	0.1012	0.0001	0.0975	0.0001	0.0002	0.7074

TABLE 13b
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 2716 Females receiving Booklet 2)

Controlling for:	Mathematics Achievement						Math Courses Taken		
	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
PROJECT	0.21235	0.08592	0.04050	0.00571	0.13913	0.04245	0.24066	0.18038	0.09274
HOW OFT WK ON PROJCT	0.0001	0.0001	0.0348	0.7660	0.0001	0.0270	0.0001	0.0001	0.0001
WRITING	0.12902	0.03325	0.00157	-0.01537	0.08149	0.01626	0.17179	0.13180	0.07579
HOW OFTEN WRITE	0.0001	0.0832	0.9348	0.4232	0.0001	0.3969	0.0001	0.0001	0.0001
FLDTRIPS	-0.07652	-0.08036	-0.07787	-0.04446	-0.04051	-0.03559	-0.02010	0.00229	0.01320
HOW OFTEN FLD TRIPS	0.0001	0.0001	0.0001	0.0205	0.0347	0.0637	0.2951	0.9049	0.4918
INDIVINS	0.02354	-0.00619	-0.02442	-0.00050	0.03634	0.00555	0.04788	0.04345	0.01496
HOW OFT INDIV INSTRT	0.2200	0.7471	0.2032	0.9794	0.0583	0.7727	0.0126	0.0235	0.4357
MACHINST	-0.00509	-0.01367	-0.01176	-0.00970	-0.01785	-0.00497	0.00990	-0.00423	0.00985
HOW OFT MACH INSTRT	0.7911	0.4764	0.5401	0.6133	0.3523	0.7957	0.6061	0.8256	0.6080
TVLECTUR	-0.08878	-0.09625	-0.10256	-0.07985	-0.06608	-0.07652	-0.01926	-0.00703	-0.00775
HOW OFT TV LECTURE	0.0001	0.0001	0.0001	0.0001	0.0006	0.0001	0.3158	0.7141	0.6862
TEXTBKS	0.24604	0.17289	0.14078	0.14127	0.22182	0.15942	0.17993	0.14614	0.07365
HOW OFT USE TEXTBOOK	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
LIBRARY	0.06399	-0.01138	-0.04365	-0.03531	0.05062	-0.01285	0.12279	0.10238	0.04890
HOW OFT USE LIBRARY	0.0008	0.5532	0.0229	0.0658	0.0083	0.5031	0.0001	0.0001	0.0108

TABLE 13c
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 587 Blacks receiving Booklet 2)

	Mathematics Achievement						Math Courses Taken		
Controlling for:	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
SEX	-0.05065	-0.07344	-0.08563	0.08506	0.08862	0.10981	0.02417	0.06263	0.07588
SEX	0.2205	0.0754	0.0381	0.0394	0.0318	0.0077	0.5589	0.1296	0.0662
NONENGL	-0.16650	-0.14010	-0.17262	-0.13423	-0.15342	-0.15778	-0.06947	-0.08882	-0.08144
	0.0001	0.0007	0.0001	0.0011	0.0002	0.0001	0.0927	0.0314	0.0486
PARED	0.31525	0.19079	0.16457	0.06731	-0.02504	0.04475	0.24096	-0.10726	-0.04408
PARENTS EDUCATION	0.0001	0.0001	0.0001	0.1033	0.5449	0.2790	0.0001	0.0093	0.2864
PARSES	0.25769	0.18662	0.14567	0.00129	-0.09029	-0.02818	0.15191	-0.13391	-0.07260
	0.0001	0.0001	0.0004	0.9752	0.0287	0.4955	0.0002	0.0011	0.0788
COMMCHAR	0.15092	0.16997	0.20819	-0.01243	-0.09283	-0.05810	-0.00019	-0.15086	-0.11500
	0.0002	0.0001	0.0001	0.7638	0.0245	0.1598	0.9964	0.0002	0.0053
NSIBS	-0.26479	-0.16647	-0.17293	-0.10974	-0.08328	-0.12705	-0.19326	-0.02833	-0.06178
	0.0001	0.0001	0.0001	0.0078	0.0437	0.0020	0.0001	0.4933	0.1349
ACADORNT	0.46086	0.28132	-0.01508	0.00533	0.38994	-0.08183	0.34873	0.24753	-0.21443
	0.0001	0.0001	0.7155	0.8975	0.0001	0.0475	0.0001	0.0001	0.0001
MOBILITY	0.01276	0.06265	0.04995	0.05865	0.01998	0.02045	-0.07096	-0.08038	-0.08423
	0.7576	0.1295	0.2269	0.1558	0.6290	0.6210	0.0859	0.0516	0.0413
AGEMONTH	0.03462	0.03673	0.02507	0.02275	0.03294	0.01348	0.00328	0.00189	-0.01897
	0.4024	0.3744	0.5444	0.5823	0.4257	0.7445	0.9367	0.9635	0.6465
TVWATCHD	-0.10820	-0.08403	-0.10634	-0.08938	-0.08205	-0.10148	-0.05544	-0.03401	-0.04536
TV WATCHED LAST NITE	0.0087	0.0418	0.0099	0.0304	0.0469	0.0139	0.1798	0.4108	0.2725
PARTACTV	0.05658	-0.02673	-0.10697	-0.08514	0.05735	-0.08250	0.13284	0.12188	-0.00823
	0.1710	0.5180	0.0095	0.0392	0.1652	0.0457	0.0013	0.0031	0.8423
LOCUSCON	0.41984	0.32383	0.26548	0.27257	0.35098	0.25759	0.21842	0.12449	0.01019
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0025	0.8055
SELFESTM	0.12256	0.09872	0.05624	0.06625	0.09594	0.05021	0.05761	0.02203	-0.02815
	0.0029	0.0167	0.1736	0.1089	0.0201	0.2245	0.1633	0.5942	0.4961
MATHCONF	0.22064	0.15554	0.12736	0.16765	0.24407	0.17866	0.13630	0.13468	0.05624
	0.0001	0.0002	0.0020	0.0001	0.0001	0.0001	0.0009	0.0011	0.1736
MATHEFFT	0.13819	0.03493	-0.04671	0.01166	0.14586	0.01816	0.17719	0.14447	0.01809
	0.0008	0.3982	0.2585	0.7781	0.0004	0.6606	0.0001	0.0004	0.6619

TABLE 13c
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 587 Blacks receiving Booklet 2)

	Mathematics Achievement						Math Courses Taken		
Controlling for:	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
MATHTKN	0.47633	-0.14449	-0.09812	-0.02755	0.39999	0.30439	1.00000	0.91222	0.81541
	0.0001	0.0004	0.0174	0.5052	0.0001	0.0001	0.0000	0.0001	0.0001
CALCUSE	0.03612	0.00792	0.01453	-0.02187	-0.02902	-0.01930	0.04810	-0.00876	0.00258
	0.3824	0.8482	0.7253	0.5969	0.4828	0.6408	0.2446	0.8322	0.9503
COMPUSE	0.05035	-0.01652	0.00114	-0.04490	-0.04167	-0.01748	0.10753	0.03290	0.05998
	0.2232	0.6896	0.9780	0.2775	0.3135	0.6726	0.0091	0.4262	0.1467
CAIMUSE	0.00841	-0.01781	0.00277	-0.01619	-0.04113	-0.00079	0.04008	-0.00544	0.03525
	0.8388	0.6668	0.9467	0.6954	0.3199	0.9847	0.3324	0.8953	0.3939
INDMUSE	-0.01316	-0.02629	-0.03497	0.01083	0.01701	0.02322	0.01687	0.02750	0.03249
	0.7504	0.5250	0.3977	0.7934	0.6809	0.5745	0.6834	0.5060	0.4321
MNIPUSE	-0.03415	-0.02423	-0.01986	-0.00268	-0.02715	-0.00230	-0.02088	-0.02412	0.00049
	0.4089	0.5580	0.6312	0.9484	0.5115	0.9557	0.6137	0.5597	0.9906
MATHLUSE	0.11260	0.05310	0.06971	0.08308	0.07804	0.11838	0.10817	0.05843	0.09012
	0.0063	0.1989	0.0915	0.0329	0.0588	0.0041	0.0087	0.1574	0.0290
STEXTUSE	-0.01013	-0.02041	-0.02984	0.02517	0.05183	0.03589	0.01323	0.04878	0.03085
	0.8065	0.6217	0.4706	0.5428	0.2098	0.3853	0.7491	0.2380	0.4556
USEDCALC	0.23857	0.15950	0.12841	0.09763	0.14385	0.09734	0.16014	0.07002	0.01618
HAVE USED CALCULATOR	0.0001	0.0001	0.0018	0.0180	0.0005	0.0183	0.0001	0.0901	0.6957
MATHFUNC	0.19651	0.09625	0.05464	0.05777	0.16197	0.07364	0.18352	0.14100	0.04922
STUDY FNS IN MATH	0.0001	0.0197	0.1861	0.1622	0.0001	0.0746	0.0001	0.0006	0.2338
TAUTMETH	-0.02449	0.01826	0.00205	0.00391	-0.02403	-0.02779	-0.06733	-0.07415	-0.07765
TAUT METRIC SYS-MATH	0.5538	0.6588	0.9605	0.9247	0.5612	0.5016	0.1032	0.0726	0.0601
TAUTMET	0.10705	0.04060	0.03058	0.04246	0.09007	0.06501	0.11737	0.09159	0.06307
TAUGHT METRIC SYSTEM	0.0094	0.3261	0.4596	0.3045	0.0291	0.1157	0.0044	0.0265	0.1270
MATHSETS	0.22414	0.12339	0.10938	0.11851	0.21032	0.15244	0.18934	0.17167	0.10437
STUDY SETS IN MATH	0.0001	0.0027	0.0080	0.0040	0.0001	0.0002	0.0001	0.0001	0.0114
LECTURE	0.16072	0.11050	0.08553	0.08415	0.11184	0.08410	0.10340	0.04873	0.01443
HOW OFTEN LECTURE	0.0001	0.0074	0.0383	0.0415	0.0067	0.0417	0.0122	0.2385	0.7271
DISCUSS	0.05368	0.03675	0.00805	0.00390	0.02577	-0.00641	0.03476	0.00693	-0.02482
HOW OFTEN DISCUSS	0.1940	0.3741	0.8458	0.9248	0.5332	0.8768	0.4005	0.8670	0.5485

TABLE 13c
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 587 Blacks receiving Booklet 2)

	Mathematics Achievement						Math Courses Taken		
Controlling for:	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
PROJECT	0.10542	0.02914	0.01318	-0.00164	0.05680	0.01992	0.13150	0.08937	0.05297
HOW OFT WK ON PROJCT	0.0106	0.4810	0.7499	0.9684	0.1693	0.6301	0.0014	0.0304	0.2000
WRITING	0.18416	0.11629	0.07845	0.09778	0.16199	0.10078	0.13366	0.09266	0.02433
HOW OFTEN WRITE	0.0001	0.0048	0.0575	0.0178	0.0001	0.0146	0.0012	0.0248	0.5564
FLDTRIPS	-0.09805	-0.08758	-0.08494	-0.08690	-0.10149	-0.08404	-0.03345	-0.03236	-0.00798
HOW OFTEN FLD TRIPS	0.0175	0.0339	0.0397	0.0353	0.0139	0.0418	0.4186	0.4338	0.8470
INDIVINS	0.02735	0.00329	-0.02297	-0.03671	-0.01097	-0.04198	0.04039	0.00788	-0.01938
HOW OFT INDIV INSTRT	0.5084	0.9367	0.5787	0.3747	0.7909	0.3099	0.3286	0.8490	0.6393
MACHINST	0.05128	-0.02289	-0.01864	-0.03682	-0.01482	-0.00254	0.11843	0.06373	0.07832
HOW OFT MACH INSTRT	0.2148	0.5799	0.6522	0.3732	0.7202	0.9510	0.0041	0.1230	0.0579
TVLECTUR	-0.10083	-0.09067	-0.09552	-0.08283	-0.07216	-0.08209	-0.03350	-0.00971	-0.01250
HOW OFT TV LECTURE	0.0145	0.0280	0.0206	0.0449	0.0807	0.0468	0.4178	0.8144	0.7624
TEXTBKS	0.17251	0.14438	0.10530	0.11713	0.15560	0.10150	0.07311	0.04435	-0.01833
HOW OFT USE TEXTBOOK	0.0001	0.0004	0.0107	0.0045	0.0002	0.0139	0.0767	0.2834	0.6577
LIBRARY	0.07028	0.04283	0.00652	0.00645	0.04029	-0.00472	0.05329	0.01804	-0.02649
HOW OFT USE LIBRARY	0.0889	0.3002	0.8747	0.8761	0.3299	0.9091	0.1973	0.6628	0.5218

TABLE 13d
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 4439 Whites receiving Booklet 2)

	Mathematics Achievement						Math Courses Taken		
Controlling for:	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
SEX	-0.11339	-0.12662	-0.16873	-0.00645	-0.00542	-0.00965	-0.01992	-0.00537	-0.00923
SEX	0.0001	0.0001	0.0001	0.6674	0.7182	0.5205	0.1845	0.7204	0.5386
NONENGL	-0.04359	-0.06463	-0.07843	-0.02358	-0.01767	-0.01948	0.01135	0.00351	0.00508
	0.0037	0.0001	0.0001	0.1163	0.2393	0.1945	0.4495	0.8150	0.7351
PARED	0.30855	0.13615	0.07473	-0.00904	0.00544	-0.00399	0.30263	0.01735	0.01050
PARENTS EDUCATION	0.0001	0.0001	0.0001	0.5470	0.7169	0.7902	0.0001	0.2478	0.4843
PARSES	0.30460	0.17593	0.11236	-0.00173	0.01616	0.00434	0.24925	0.02420	0.01457
	0.0001	0.0001	0.0001	0.9082	0.2818	0.7725	0.0001	0.1069	0.3316
COMMCHAR	0.18204	0.11058	0.12485	-0.01175	0.00005	0.00001	0.14249	0.03044	0.02645
	0.0001	0.0001	0.0001	0.4337	0.5918	0.9997	0.0001	0.0426	0.0781
NSIBS	-0.10658	-0.05786	-0.02603	0.01743	0.00948	0.01891	-0.09163	0.00013	0.00735
	0.0001	0.0001	0.0829	0.2456	0.5279	0.2078	0.0001	0.9930	0.6245
ACADORNT	0.56669	0.24893	-0.03684	-0.00442	0.47281	0.01031	0.55716	0.46121	0.03531
	0.0001	0.0001	0.0141	0.7685	0.0001	0.4923	0.0001	0.0001	0.0186
MOBILITY	-0.08225	-0.05933	-0.07066	-0.04175	-0.03379	-0.05360	-0.05320	-0.02177	-0.03805
	0.0001	0.0001	0.0001	0.0054	0.0244	0.0004	0.0004	0.1470	0.0112
AGEMONTH	0.02807	0.00348	-0.00162	0.00949	0.04085	0.02205	0.03815	0.04896	0.03292
	0.0615	0.8167	0.9142	0.5271	0.0065	0.1419	0.0110	0.0011	0.0283
TVWATCHD	-0.13273	-0.04772	-0.02298	-0.03200	-0.10657	-0.05913	-0.14311	-0.11577	-0.07357
TV WATCHED LAST NITE	0.0001	0.0015	0.1259	0.0330	0.0001	0.0001	0.0001	0.0001	0.0001
PARTACTV	0.10331	0.00315	-0.08192	-0.05607	0.08467	-0.04603	0.15191	0.12632	0.01281
	0.0001	0.8338	0.0001	0.0002	0.0001	0.0022	0.0001	0.0001	0.3934
LOCUSCON	0.37257	0.20925	0.11608	0.13779	0.32225	0.16675	0.31195	0.25375	0.10056
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
SELFESTM	0.15935	0.07068	0.02280	0.01678	0.12296	0.03540	0.15587	0.12885	0.04940
	0.0001	0.0001	0.1288	0.2636	0.0001	0.0183	0.0001	0.0001	0.0010
MATHCONF	0.37471	0.22779	0.18185	0.21467	0.37667	0.26565	0.29307	0.28684	0.17109
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
MATHEFFT	0.26103	0.08466	-0.02543	0.04138	0.26275	0.07921	0.29241	0.26934	0.10191
	0.0001	0.0001	0.0903	0.0058	0.0001	0.0001	0.0001	0.0001	0.0001

TABLE 13d
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 4439 Whites receiving Booklet 2)

	Mathematics Achievement						Math Courses Taken		
Controlling for:	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
MATHTKN	0.61369	-0.06315	-0.07428	-0.00391	0.52538	0.33544	1.00000	0.94555	0.83440
	0.0001	0.0001	0.0001	0.7946	0.0001	0.0001	0.0000	0.0001	0.0001
CALCUSE	-0.03471	-0.02791	-0.01632	-0.02840	-0.04558	-0.02839	-0.01903	-0.02494	-0.00602
	0.0207	0.0629	0.2771	0.0585	0.0024	0.0585	0.2049	0.0966	0.6884
COMPUSE	0.02542	-0.02291	-0.01651	-0.02371	-0.00682	-0.00035	0.06561	0.03953	0.05246
	0.0904	0.1270	0.2713	0.1142	0.6498	0.9812	0.0001	0.0084	0.0005
CAIMUSE	0.02282	-0.02379	-0.01379	-0.02068	-0.00324	0.00484	0.06274	0.04389	0.05841
	0.1285	0.1130	0.3585	0.1683	0.8294	0.7473	0.0001	0.0034	0.0001
INDMUSE	0.01775	0.01417	0.01765	0.02165	0.01426	0.02409	0.00986	0.00328	0.01061
	0.2370	0.3452	0.2397	0.1492	0.3422	0.1085	0.5114	0.8269	0.4798
MMIPUSE	0.00133	0.00474	-0.00121	0.00339	0.00535	-0.00094	-0.00364	-0.00292	-0.00994
	0.9292	0.7525	0.9360	0.8214	0.7217	0.9500	0.8086	0.8457	0.5080
MATHLUSE	0.02973	-0.01243	-0.00979	-0.01562	0.01333	0.00547	0.05962	0.05023	0.04860
	0.0476	0.4075	0.5141	0.2980	0.3747	0.7156	0.0001	0.0008	0.0012
STEXTUSE	0.00187	0.00428	-0.00951	0.00976	0.02623	0.00544	-0.00229	0.01257	-0.00856
	0.9008	0.7754	0.5264	0.5155	0.0086	0.7170	0.8790	0.4023	0.5686
USEDCALC	0.16483	0.10106	0.07381	0.06939	0.12705	0.08370	0.12789	0.09472	0.04997
HAVE USED CALCULATOR	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0009
MATHFUNC	0.28389	0.13198	0.10678	0.12168	0.25517	0.18286	0.27045	0.24460	0.17645
STUDY FNS IN MATH	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
TAUTMETH	0.01708	0.03680	0.04261	0.03324	0.01585	0.02432	-0.01813	-0.01757	-0.01490
TAUT METRIC SYS-MATH	0.2552	0.0142	0.0045	0.0268	0.2910	0.1052	0.2273	0.2418	0.3211
TAUTMET	0.21000	0.09119	0.06591	0.06838	0.17884	0.11171	0.20772	0.18236	0.12117
TAUGHT METRIC SYSTEM	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
MATHSETS	0.23642	0.12123	0.09863	0.11208	0.21091	0.15624	0.21173	0.18653	0.13249
STUDY SETS IN MATH	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
LECTURE	0.22353	0.12551	0.06965	0.07040	0.17247	0.08533	0.18720	0.13707	0.05169
HOW OFTEN LECTURE	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0006
DISCUSS	0.11081	0.04844	0.00225	0.02023	0.09647	0.02879	0.10922	0.08865	0.02536
HOW OFTEN DISCUSS	0.0001	0.0012	0.8811	0.1777	0.0001	0.0551	0.0001	0.0001	0.0911

TABLE 13d
CORRELATIONS AND PARTIAL CORRELATIONS OF MAIN STUDY VARIABLES
WITH MATH ACHIEVEMENT, MATH COURSES TAKEN, AND ACADEMIC ORIENTATION
(Based on 4439 Whites receiving Booklet 2)

Controlling for:	Mathematics Achievement						Math Courses Taken		
	-	mathtkn	mathtkn acadornt	mathtkn acadornt bckgrnd	bckgrnd	acadornt bckgrnd	-	bckgrnd	acadornt bckgrnd
SEX	-0.11339	-0.12662	-0.16873	-0.00645	-0.00542	-0.00965	-0.01992	-0.00537	-0.00923
PROJECT	0.22708	0.09570	0.04988	0.05061	0.17663	0.08841	0.22808	0.18375	0.10380
HOW OFT WK ON PROJCT	0.0001	0.0001	0.0009	0.0007	0.0001	0.0001	0.0001	0.0001	0.0001
WRITING	0.11423	0.00040	-0.04577	-0.02293	0.08790	0.01082	0.17164	0.14090	0.07821
HOW OFTEN WRITE	0.0001	0.9786	0.0023	0.1266	0.0001	0.4709	0.0001	0.0001	0.0001
FLDTRIPS	-0.07649	-0.06235	-0.07566	-0.06424	-0.05578	-0.07323	-0.04092	-0.02459	-0.03577
HOW OFTEN FLD TRIPS	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0064	0.1015	0.0172
INDIVINS	0.02628	-0.00234	-0.01918	-0.01746	0.01607	-0.01177	0.04239	0.03320	0.01028
HOW OFT INDIV INSTRT	0.0800	0.8764	0.2013	0.2449	0.2845	0.4329	0.0047	0.0270	0.4937
MACHINST	-0.01488	-0.02428	-0.02786	-0.02668	-0.02673	-0.02468	0.00653	-0.00581	-0.00073
HOW OFT MACH INSTRT	0.3218	0.1058	0.0635	0.0755	0.0750	0.1002	0.6636	0.6989	0.9612
TVLECTUR	-0.08851	-0.08330	-0.08181	-0.08207	-0.08194	-0.08196	-0.03407	-0.02577	-0.01718
HOW OFT TV LECTURE	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0232	0.0861	0.2525
TEXTBKS	0.25167	0.14214	0.09629	0.11464	0.22000	0.14330	0.20977	0.17260	0.09490
HOW OFT USE TEXTBOOK	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
LIBRARY	0.08980	0.01179	-0.02913	-0.02449	0.06386	-0.00696	0.12126	0.09775	0.03794
HOW OFT USE LIBRARY	0.0001	0.4323	0.0523	0.1028	0.0001	0.6428	0.0001	0.0001	0.0115

TABLE 14 PARTIAL CORRELATION OF MATH ACHIEVEMENT WITH SEX AND RACE AFTER CONTROLLING FOR DIFFERENT INTERVENING MEASURES
(Based on 5324 Booklet 2 Examinees)

Variable Controlled	Correlation with: Sex	Race
Math Taken	-0.1105 0.0001	0.4029 0.0001
Academic Aptitude	-0.1543 0.0001	0.4422 0.0001
Math Effort	-0.1584 0.0001	0.4201 0.0001
Math Confidence	-0.0866 0.0001	0.4336 0.0001
Locus of Control	-0.1465 0.0001	0.3835 0.0001
Self Esteem	-0.0913 0.0001	0.4196 0.0001
Extra Activity	-0.1049 0.0001	0.4102 0.0001
Parent's Education	-0.1123 0.0001	0.3399 0.0001
Parent's SES	-0.0953 0.0001	0.3238 0.0001
No. of Siblings	-0.0969 0.0001	0.3676 0.0001
None	-0.0980 0.0001	0.4074 0.0001

Note: Entries are partial correlations for Sex or Race with Math Achievement controlling for the indicated variables, followed by the significance level of the correlation. High values for sex indicate female; high values for race indicate White.

REFERENCES

Jencks, C. S. & Brown, M. S. Effects of high schools on their students. Harvard Educational Review, 1975, 45, 273-324.

National Assessment of Educational Progress. Mathematics technical report: Summary volume. (Report No. 09-MA-21). Denver: Education Commission of the States, April 1980.

Reys, R. E. Consumer math: Just how knowledgeable are U.S. young adults? Phi Delta Kappan, 1976, 58, 258-260.

Wise, L. L. & Steel, L. J. The effects of school quality on students' knowledge and skills. Paper presented at the annual meeting of the American Educational Research Association, April 1979.

Wise, L. L., Steel, L. J., & MacDonald, C. Origins and career consequences of sex differences in high school mathematics achievement. Palo Alto, Calif.: American Institutes for Research, 1979.

Wise, L. L. & McLaughlin, D. H. Survey data enhancement. Paper presented at the annual meeting of the American Educational Research Association, April 1981.